

**SITE DIAGNOSIS,
TREE SPECIES SELECTION,
AND
SLASHBURNING GUIDELINES
FOR
THE VANCOUVER FOREST REGION**

Abridged version

by

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1. INTRODUCTION

This is the third revision of a guide which aims to assist field personnel in understanding and describing forest sites for ecologically sound decision making. This abridged version of the guide contains only information required for field use. The complete guide contains detailed background information (Klinka *et al.* 1984).

This guide consists of three sections; site diagnosis, tree species selection, and slashburning guidelines. Site diagnosis is a procedure used to evaluate the quality of forest sites using the three site elements, climatope, hygrotape, and trophotape. These elements are used to classify forest sites within the framework of an edatopic grid. Closely related sites are grouped into site units which are displayed in the grids and form the basis for presenting tree species recommendations. A new approach to making recommendations for prescribed burning is adopted. It is based on a classification of site sensitivity to fire which is determined using environmental properties assessed for site diagnosis.

Appendix I contains an alphabetical list of indicator plant species (by Latin and common names). Latin names for plant species have been used on the grids because: i) a particular species may be known by several different common names, and ii) a significant number of indicator species are mosses which generally don't have common names. Appendix II contains the identification of sixty commonly occurring indicator species. Appendices III to VIII contain all keys required to conduct site diagnosis and determine site sensitivity class to fire.

2. SITE DIAGNOSIS GUIDELINES

2.1 Concept

A forest site is defined as an area homogeneous in all environmental conditions significant for the development of forest communities. This mainly relates to climate, physiography and soil properties.

Site diagnosis is a field based procedure used to determine the quality of forest sites. Environmental properties such as slope position, soil texture, humus form, etc., are examined together with indicator plant species for each site. This information provides a sufficient base on which to characterize the site using the three site elements: climatope (biogeoclimatic unit), hygrotape (soil moisture regime), and trophotape (soil nutrient regime).

The success in making correct site diagnoses rests on a) the ability to recognize the different sites that may comprise a stand or cut over area, and b) identifying the three site elements.

2.1.1 Climatope

Biogeoclimatic units represent large areas of land which are under the influence of similar regional climates, as reflected in the distribution of similar climax or near-climax vegetation on zonal sites. Zonal sites best express the climate of an area as they are least influenced by local relief or soil properties, and are described as follows. They are intermediate in moisture and nutrient regimes, and typically occur on middle positions of gentle to moderate slopes. Soils are generally loamy textured without root restricting layers (bedrock or hardpan) within 50 cm of the surface. Zonal sites are the key to identifying biogeoclimatic units in the field.

Three categories of biogeoclimatic units are used, zone (most general), subzone, and variant (most specific). Table 1 shows a synopsis of the 6 zones, 14 subzones, and 15 variants found in the Vancouver Forest Region. Figure 1 shows the distribution of hypermaritime, maritime, submaritime and subcontinental areas which are used in naming biogeoclimatic subzones and variants. A detailed description of the biogeoclimatic units of the Vancouver Forest Region is found in the complete guide.

To identify the biogeoclimatic unit for a particular area, consult the biogeoclimatic map. This may be all that is necessary if the area is well within a particular map polygon, however due to errors of scale, field identification is recommended. Zonal sites with climax or near-climax vegetation should be examined and compared with characteristic features for biogeoclimatic units contained in the complete guide.

If no climax stands can be found in the area, older immature stands which feature shade-tolerant tree species growing in the understory may be used. However, variation from the characteristic features can be expected. Another option is to compare the pattern of site units and characteristic indicator plant species shown on the edatopic grids, with those present in the area.

2.1.2 Hygrotape

Hygrotape is defined as the capacity of a soil to supply available water for plant growth. To classify hygrotape we use a "potential" hygrotape and an "actual" hygrotape.

Table 1 Biogeoclimatic units in the Vancouver Forest Region.

Zone	Subzone	Variant ¹	Equivalent Units	
			2nd approx. imation ²	Other ³
ALPINE TUNDRA (AT)	Coastal AT (ATa)		—	ATa, ATb
MOUNTAIN HEMLOCK (MH)	Parkland MH (MHp)		—	MHap, MHbp
	Maritime Forested MH (MHa)		MHxa	MHax, MHaz, MHaz
	Submaritime Forested MH (MHb)		MHya	MHb
ENGELMANN SPRUCE SUBALPINE FIR (ESSF)	Parkland ESSF (ESSFp)		—	—
	Subcontinental Forested ESSF (ESSFi)		ESSFa	ESSFi
	Dry Southern Forested ESSF (ESSFe)		—	ESSFe
INTERIOR DOUGLAS FIR (IDF)	Subcontinental IDF (IDFe)	Southern IDFe (IDFe ¹)	IDFb	IDFe
		Central IDFe (IDFe ²)	—	CWHhz
	(Undifferentiated IDf (IDFu))		—	IDFb, IDFc, IDFd
COASTAL DOUGLAS FIR (CDF)	Drier Maritime CDF (CDFa)		CDFa	CDFa ¹
	Wetter Maritime CDF (CDFb)		CDFb	CDFb ¹ , CDFb ²
COASTAL WESTERN HEMLOCK (CWH)	Drier Maritime CWH (CWHa)	Vancouver Island CWHa (CWHa ¹) Pacific Ranges CWHa (CWHa ²)	CWHxa	CWHa ¹ , CWHa ²
			CWHxa	CWHa ³
	Wetter CWH (CWHb)	Windward Sub- montane Maritime CWHb (CWHb ¹) Windward Montane Maritime CWHb (CWHb ²) Leeward Sub- montane Maritime CWHb (CWHb ³) Leeward Montane Maritime CWHb (CWHb ⁴) Southern Sub- maritime CWHb (CWHb ⁵) Central Sub- maritime Lower CWHb (CWHb ⁶) Central Sub- maritime Upper CWHb (CWHb ⁷)	CWHxb-s CWHxb-m CWHxb-s CWHxb-m CWHyb — —	CWHb ¹ , CWHb ² , (CWHa), (CWHa ¹) CWHb ³ , CWHb ⁴ , (CWHa), (CWHa ¹) CWHb ⁵ CWHb ⁶ CWHb ⁷
		Southern CWHc (CWHc ¹)	CWHya	CWHc
		Central CWHc (CWHc ²)	—	CWHh ¹
	Hypermaritime CWH (CWHd)	Southern CWHd (CWHd ¹) Central CWHd (CWHd ²)	— —	CWHb ¹ (CWHh), (CWHh ¹) CCPH

¹ In several cases variants have not been identified because of insufficient data.² Second Approximation - Klinka (1977).³ Other includes Klinka *et al.* (1979, 1980), Inselberg *et al.* (1982) and Courtn *et al.* (1981), and several unpublished Ministry of Forests internal reports. Parenthesis around symbols indicate that the unit has been divided.⁴ The IDF has not been fully differentiated into subzones because of insufficient data.

Potential hygrotope refers to the potential capacity of a soil to hold and lose or receive water, based on its properties and relief, regardless of climate. It allows environmental properties to be used as a step in determining actual hygrotope. Eight classes ranging from 0 (potentially driest) to 7 (potentially wettest) are recognized. Potential hygrotope is used for describing soil moisture regime in operational application, provided it is related to a biogeoclimatic unit.

Actual hygrotope refers to the actual amount of water supplied by a soil for plant growth. It takes into consideration the water supplied through climatic inputs. Actual hygrotope expresses moisture supply in terms of the annual water balance. Nine classes are recognized, with the dry classes representing moisture regimes with deficits of varying durations, the fresh class representing regimes with no deficit and no surplus during the growing season, and the moist to wet classes representing regimes with a surplus of moisture during the growing season, dif-



Figure 1. Map showing the distribution of hypermaritime, maritime, submaritime, and subcontinental areas, as applied in naming biogeoclimatic subzones and variants.

ferentiated by the water table depth (Table 2). For practical purposes, the very moist and very wet classes were combined with the moist and wet classes respectively.

Table 2. Classes of actual hygrotopy.

Actual Hygrotopy
extremely dry
very dry
moderately dry
slightly dry
fresh
moist
very moist
wet
very wet

2.1.3 Trophotopy

Trophotopy is defined as the capacity of a soil to supply nutrients for plant growth. It has been related to selected soil chemical properties which include total nitrogen, exchangeable bases (Ca, Mg, K), and pH and C/N ratio of the humus form. Trophotopy can be inferred from directly observable soil properties such as humus form and soil mineralogy which can be related to the reserve and supply of nutrients.

Five classes are recognized for trophotopy. They range from nutrient very poor (A) which is characterized by low amounts of nitrogen and exchangeable bases and slow decomposition of organic matter, to nutrient very rich (E) which has high amounts of nitrogen and exchangeable bases and rapid decomposition of organic matter (Table 3).

Table 3. Classes of trophotopy.

Symbol	Name
A	nutrient very poor
B	nutrient poor
C	nutrient medium
D	nutrient rich
E	nutrient very rich

2.2 Procedures for Site Diagnosis

To diagnose a site, a selected number of vegetation and environmental properties should be described. This should be carried out on a homogeneous area of approximately 400 m² in size which is representative of the site. As the environmental analysis requires examination of the soil, a soil pit should be dug, extending through the rooting zone. A depth of 30 to 60 cm will be sufficient in most situations. Avoid locating the soil pit on disturbed (i.e. old skid trails) or atypical substrates (i.e. decaying logs, wet depressions, etc.). Road cuts or root turns may also be used, provided the disturbed face is cut back to expose fresh material.

A description form, such as that shown in the complete guide should be used to record data. Familiarity with sites may eventually preclude the necessity of filling in a form. Figure 2 shows the sequence of major steps which should be followed when conducting site diagnosis.

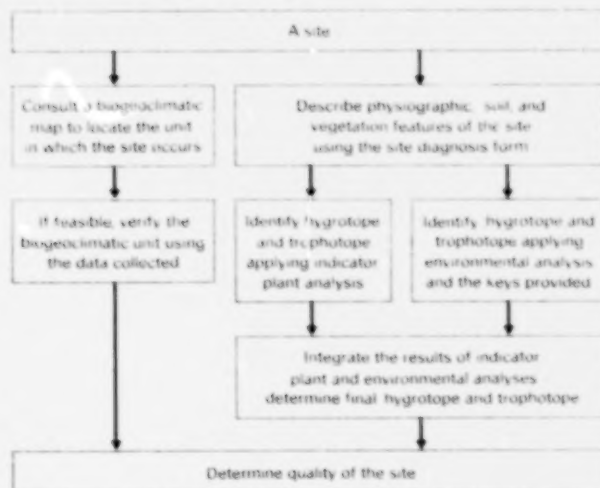


Figure 2. Flowchart illustrating steps for site diagnosis

2.2.1 Environmental Analysis

Environmental analysis includes evaluation of a selected number of physiographic and soil morphological properties which are used to determine hygrotome and trophotome (Table 4).

Discussion of each property and its relationship to hygrotome and trophotome is provided in the complete guide. The following comments relate to the field assessment of these properties.

Table 4. Site properties selected for environmental analysis.

Physiographic properties	Soil properties
elevation ¹	humus form and its thickness
slope aspect	A horizon
slope gradient	soil depth
slope position	organic matter content
slope shape	texture
	content of coarse fragments
	porosity and aeration
	mineralogy
	groundwater table
	gleyed horizons
	incidence of flooding

¹ used only in the identification of biogeoclimatic units

2.2.1.1 Physiographic Properties

Elevation: obtain from topographic maps or measure with an altimeter.

Aspect: express in degrees azimuth or by general cardinal points (i.e. N, NE, E, etc.).

Slope: express in percent.

Slope position: evaluate for the slope segment which directly affects water movement in the site (i.e. the slope between major topographic irregularities). Figure 3 shows the slope segment and classes describing slope position.



Figure 3. The slope segment and classes used to describe slope position.

Slope shape: describe the general shape of the slope the site is situated on, i.e. convex, concave or straight shaped.

2.2.1.2 Soil Properties

Humus form and its thickness: measure the average thickness of the organic horizons (forest floor), and note the type of organic horizons (particularly F horizon). Use the key in Appendix III to determine the type of humus form. On recently disturbed clearcuts, the type of humus form may be very difficult to classify. In such cases, emphasize other site properties in determining trophotope.

A horizons: note the presence of an Ae (eluviated, greyish coloured) or Ah (enriched with organic matter, darker coloured than underlying soil) upper soil horizon, and measure the average thickness.

Soil depth: measure the average depth of the soil from the mineral soil surface to a restricting layer if present. Restricting layers include bedrock, compacted (basal) till, strongly cemented layers, etc. which completely restrict root penetration. Soil depth may be estimated in general terms by noting the presence of exposed bedrock outcrops on the site, indicating a shallow soil.

Soil organic matter content: organic matter, when mixed in the mineral soil, imparts a dark brown to black colour. Note the overall colour of the soil in the rooting zone and categorize into three classes; light, medium, or dark coloured.

Soil texture and content of coarse fragments: estimate average soil texture within the rooting zone using the key in Appendix IV. As texture applies only to soil material less than 2 mm in diameter, try to remove as many coarse fragments from the sample as possible. Content of coarse fragments (particles > 2 mm diameter) is estimated visually as a percentage of the total volume of soil material.

Soil porosity and aeration: soil porosity is estimated by noting the presence of obvious pores (i.e. old root channels, large pores), and by the structure and density of the soil. Light, fluffy soils with good structure have high porosity, whereas heavy, dense soils with poorly-defined structure have low porosity. Aeration is related to porosity, and may be expressed in the soil colour. Reddish colours are associated with well-aerated soils, while yellowish colours indicate intermediate aeration. Blue and olive colours indicate poorly-aerated soils, while mottling usually indicates a zone of seasonally good or intermediate and poor aeration.

Soil mineralogy: determine the rock type of a number of coarse fragments found in the soil, or underlying bedrock if present. Break the rock samples to expose an unweathered surface and use the identification key in Appendix VIII. The objective is to determine the predominant rock type(s) which the soil is derived from and its base-status.

Groundwater and incidence of flooding: note the presence of seepage water or a groundwater table in the soil pit and measure its depth from the ground surface. Fluctuating seepage or groundwater may not be present at the time of sampling but could be expressed by 'gleyed' horizons in the soil. These are recognized by dull bluish to grey soil colours and/or distinct reddish coloured mottles. Incidence of flooding is estimated by noting the proximity of the site to a stream, elevation of the site in relation to the stream (i.e. raised terrace, or low bench) and evidence of recent deposits of sediment on the ground surface.

2.2.1.3 Synthesizing Results of Environmental Analysis

Although it is important to understand the effect of the individual environmental properties on hygrotape and trophotape, it is their **combined** effect which must be considered in the final evaluation. As it is often difficult to sort out all the compensating interactions amongst these properties, we have developed keys to aid in the identification of hygrotape and trophotape (Appendices V and VI). Both keys use properties determined from the environmental analysis.

2.2.2 Indicator Plant Analysis

As vegetation is one of the best expressions of all factors influencing a site, the analysis of plant indicators is carried out as a further means of identifying hygrotape and trophotape. Eighteen edatopic indicator species groups (EISG) are recognized, each group containing a number of species from southwestern B.C. with similar ranges in hygrotape and trophotape. The groups are referenced by a two digit number. The first digit indicates the range in trophotape (1 - poor to medium, 2 - medium, 3 - medium to rich) while the second digit connotes the range in hygrotape (1 - driest, 7 - wettest). This latter digit does not correlate with the potential hygrotape classes. Table 5 shows a synopsis of the groups. An alphabetical list of all indicator plant species and the EISG which they belong to is given in Appendix I (by Latin and common names).

Table 5. Synopsis of edatopic indicator species groups.

1. Nutrient-very poor to medium sites

EISG No. 1.1	Very dry, nutrient very poor to poor sites
EISG No. 1.2	Very dry to dry, nutrient very poor to medium sites
EISG No. 1.3	Dry to fresh, nutrient very poor to medium sites
EISG No. 1.4	Dry to moist, nutrient very poor to medium sites
EISG No. 1.5	Fresh to moist, nutrient very poor to medium sites
EISG No. 1.6	Moist to wet, nutrient very poor to medium sites
EISG No. 1.7	Wet, nutrient very poor to medium sites

2. Nutrient-medium sites

EISG No. 2.1	Very dry to dry, nutrient (poor to) medium sites
EISG No. 2.2	Dry to fresh, nutrient medium sites
EISG No. 2.3	Dry to moist, nutrient medium sites
EISG No. 2.4	Fresh to moist, nutrient medium sites

3. Nutrient-medium to very rich sites

EISG No. 3.1	Very dry, nutrient medium (-to rich) sites
EISG No. 3.2	Very dry to dry, nutrient medium to very rich sites
EISG No. 3.3	Dry to fresh, nutrient medium to very rich sites
EISG No. 3.4	Dry to moist, nutrient medium to very rich sites
EISG No. 3.5	Fresh to moist, nutrient medium to very rich sites
EISG No. 3.6	Moist to wet, nutrient medium to very rich sites
EISG No. 3.7	Wet, nutrient medium to very rich sites

The indicator plant analysis involves noting the major EISG's represented by the plants found on a site, and comparing these to the EISG's considered characteristic for site units displayed on the edatopic grids. Figure 4 shows the sequence of steps which should be followed to carry this out.

Indicator plant analysis should be conducted on sites with reasonably well developed understory vegetation. Indefinite results may occur if the analysis is

attempted in dense stands with sparse understory vegetation, or recently disturbed sites featuring early seral vegetation (e.g. a fireweed community).

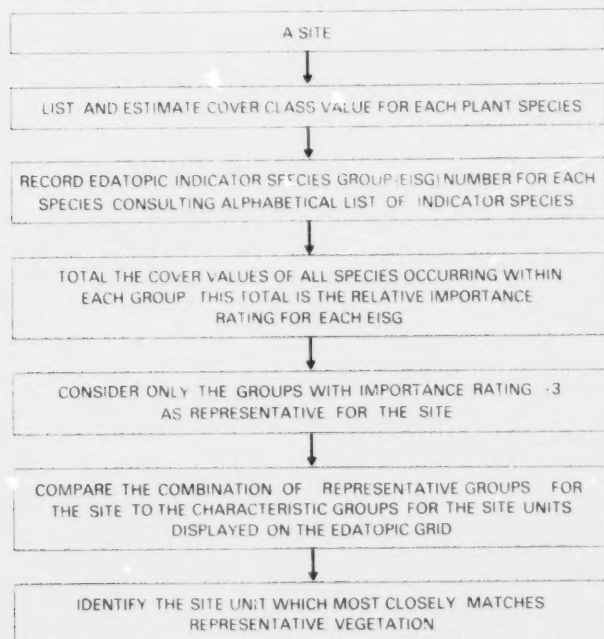


Figure 4. Flowchart illustrating steps for indicator plant analysis.

Vegetation data is collected on a sample area considered representative for the site. All plants should be listed except those growing on atypical substrates such as decaying logs or exposed rock. Commonly occurring plants which cannot be identified in the field should be collected for later identification. When estimating cover for each species, use the cover classes shown in Table 6. Percent cover

Table 6. Cover scale recommended for indicator plant analysis.

Symbol	Percent cover
+	< 1
1	1 - 5
2	5 - 25
3	25 - 50
4	50 - 75
5	> 75

refers to the proportion of the ground area covered by a vertical projection of the foliage onto the ground surface.

A detailed description of the procedure for indicator plant analysis, including matching site EISG's to characteristic EISG's on the grids, is given in the complete guide.

2.2.3 Integrating Environmental and Indicator Plant Analysis

Ideally, hygrotome and trophotome inferred from environmental analysis should agree with that inferred from indicator plant analysis. However, these will not correlate clearly in all situations. In general, we recommend a greater emphasis be placed on the environmental analysis in such cases, although an attempt to explain encountered discrepancies should be made.

2.2.4 Setting Examination

The objective of a setting examination is to identify and characterize the setting's major component sites, and delineate these on a map. Figure 5 shows a sequence of steps which should be followed for setting examination.

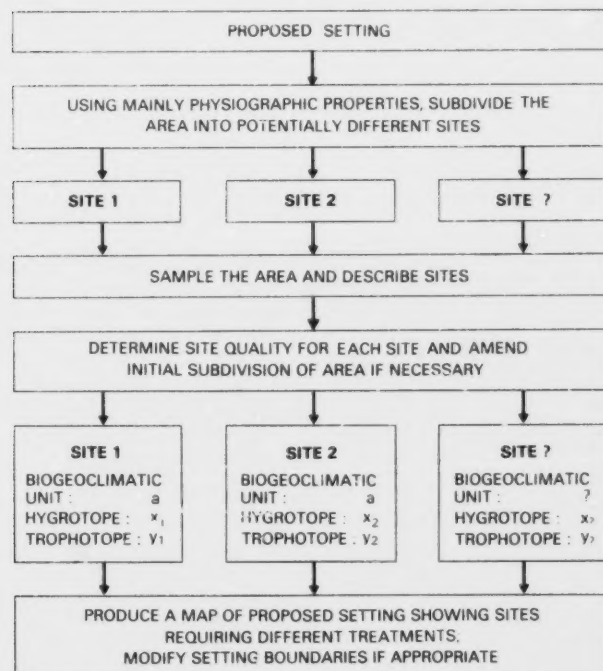


Figure 5. Flowchart illustrating steps for site diagnosis and mapping of a setting.

This examination is best conducted at the pre-harvesting stage when options are greatest, however, it can also be carried out on cutover areas. Initial subdivision of the setting into component sites is followed by field sampling to verify the map and characterize the sites. Over-stratification of the area into more component sites than can be managed should be avoided. Based on this information the most appropriate site-specific treatments can be proposed, and if necessary, boundaries may be revised or a cutting sequence proposed to allow their most feasible application. Figure 6 shows an example of a setting with major component sites characterized and mapped.

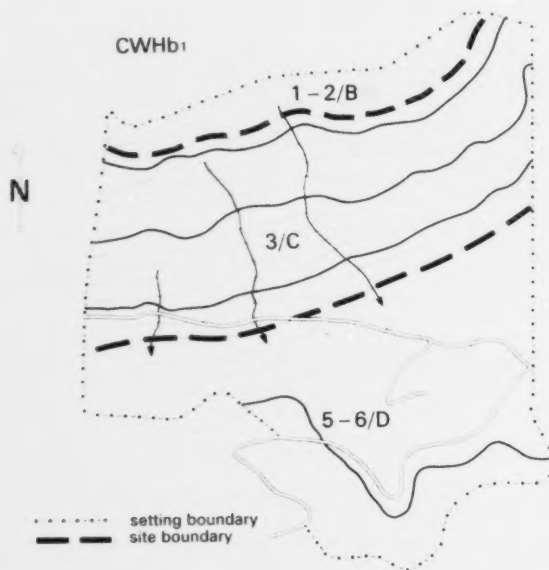


Figure 6. Subdivision of a setting into major component sites.

3. TREE SPECIES SELECTION GUIDELINES

These guidelines are based on the principles of tree species selection described in the complete guide. The fundamental basis of the principles is to match the ecologically viable species options to management objectives, using the selection criteria of maximum productivity, crop reliability, and silvicultural feasibility.

The recommendations for tree species selection are presented in the format of an edatopic grid. Each grid refers to a biogeoclimatic unit or group of biogeoclimatic units (when tree species recommendations and indicator plant species are similar). Hygrotope and trophotope form the coordinates of the grid. Site units are delineated by bold lines. They represent groups of closely related forest sites which can support stands of the same composition and structure, have similar production potential and can be managed by the same silvicultural regime. Special floodplain subunits are recognized within fresh to moist nutrient medium to rich site units for most submontane biogeoclimatic units.

Each site unit on a grid displays an identification number, the recommended tree species symbols, a growth class symbol and both the identification number and one commonly occurring species for each characteristic edatopic indicator species group. The site unit identification number serves as a reference to comments presented beside each grid.

The symbols for tree species follow Ministry of Forests standards (Table 7) and are listed in order of increasing shade tolerance. The size of the symbol indicates the percent contribution to stand basal area at maturity. Major crop species are indicated by large symbols and can contribute up to 100% of the stand basal area. Minor crop species are represented by small symbols and should comprise 20% or less of the basal area. Non-crop species usually occur naturally or can be planted for ameliorative purposes. They are not shown on the grids but may be mentioned in the comments. The productivity class symbols for the site units are G, M, P and L (good, medium, poor and low).

Table 7. List of symbols, common, and latin names of tree species.

Symbol	Common Name	Latin Name
Ac	black cottonwood	<i>Populus trichocarpa</i> Torr. & Gray ex Hook.
Ba	amabilis fir	<i>Abies amabilis</i> (Dougl. ex Loud.) Forbes
Bg	grand fir	<i>Abies grandis</i> (Dougl. ex D. Don) Lindl.
Bl	subalpine fir	<i>Abies lasiocarpa</i> (Hook.) Nutt.
Bp	noble fir	<i>Abies procera</i> Rehder
Cw	western redcedar	<i>Thuja plicata</i> Donn ex D. Don in Lamb.
Fd	Douglas-fir	<i>Pseudotsuga menziesii</i> (Mirb.) Franco.
Hm	mountain hemlock	<i>Tsuga mertensiana</i> (Bong.) Carr.
Hw	western hemlock	<i>Tsuga heterophylla</i> (Raf.) Sarg.
Lw	western larch	<i>Larix occidentalis</i> Nutt.
Pl	lodgepole pine	<i>Pinus contorta</i> Dougl. ex Loud.
Pw	western white pine	<i>Pinus monticola</i> Dougl. ex D. Don in Lamb.
Py	yellow pine	<i>Pinus ponderosa</i> Dougl. ex P. & C. Lawson.
Se	Engelman spruce	<i>Picea engelmannii</i> Parry ex Engelm.
Ss	Sitka spruce	<i>Picea sitchensis</i> (Bong.) Carr.
Yc	yellow-cedar	<i>Chamaecyparis nootkatensis</i> (D. Don) Spach.

The procedure for choosing the species is outlined in Figure 7. The tree species and/or stand composition recommended for each site unit may not represent the most suitable options for a particular area or situation, thus they are open to amendments which should consider local biological, environmental, and management conditions. In particular, transition areas between biogeoclimatic units or local climates within a biogeoclimatic unit may require consulting two grids to select the appropriate species.

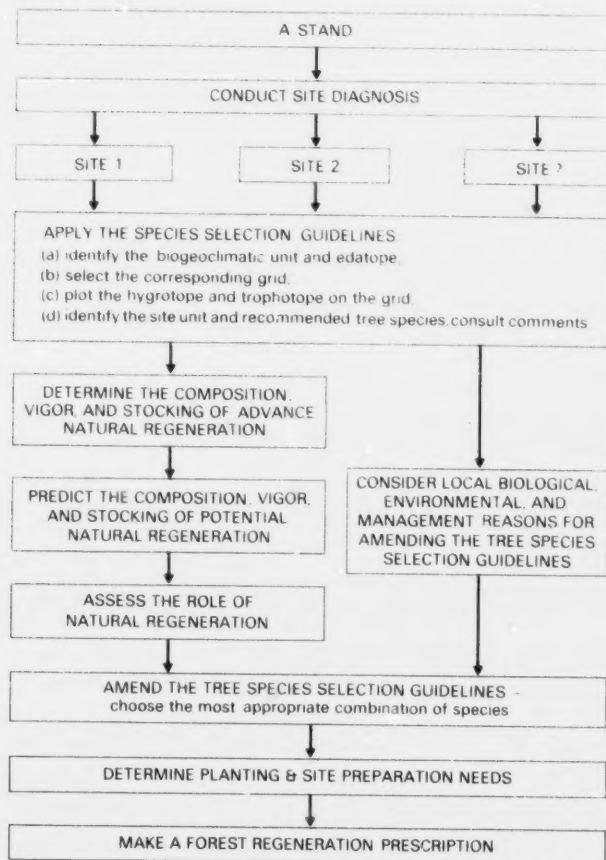


Figure 7. A sequence depicting the decision-making process in the choice of species for regeneration of forest sites on a site-and situation-specific basis.

Comments presented beside each grid provide information and alternatives to the recommended options. Other alternatives can be made by modifying the number of species, choice between major and minor species, and proportions of the major species. When amending the grids, one should consider the following factors:

- (a) productivity and structure of second growth stands of different tree species growing on similar sites.
- (b) hazards likely to affect local timber crops.
- (c) feasibility of the silvicultural treatments required under the existing management constraints (e.g., advanced and/or potential natural regeneration of desired tree species may significantly reduce the site preparation and establishment costs).

An index of grid numbers and associated biogeoclimatic units is provided in Table 8.

Table 8 Grid number and associated biogeoclimatic unit

Grid No.	Biogeoclimatic unit		Page
	Symbol	Name	
1	MHa	Maritime Forested MH Subzone	18
2	MHb	Submaritime Forested MH Subzone	20
3	ESSF1	Subcontinental Forested ESSF Subzone and related units	22
4	IDFe1	Southern Subcontinental IDF Variant and related units	24
5	IDFe2	Central Subcontinental IDF Variant and related units	26
6	CDF	CDF Zone	28
7	CWHa1	Vancouver Island Drier Maritime CWH Variant	30
8	CWHa2	Pacific Ranges Drier Maritime CWH Variant	32
9	CWHb1	Windward Submontane Maritime Wetter CWH Variant	34
10	CWHb2	Windward Montane Maritime Wetter CWH Variant	36
11	CWHb3	Leeward Submontane Maritime Wetter CWH Variant	38
12	CWHb4	Leeward Montane Maritime Wetter CWH Variant	40
13	CWHb5	Southern Submaritime Wetter CWH Variant	42
14	CWHb6	Central Submaritime Lower Wetter CWH Variant	44
15	CWHb7	Central Submaritime Upper Wetter CWH Variant	46
16	CWHc1	Southern Drier Submaritime CWH Variant	48
17	CWHc2	Central Drier Submaritime CWH Variant	50
18	CWHd	Hypermaritime CWH Subzone	52

Comments on the Recommended Tree Species for
the Maritime Forested MH Subzone (MHa) - Grid No. 1.

General comments:

- advance natural regeneration of **Ba**, **Hm** and **Yc** may provide much of the desired component of those species
- **Se** is recommended as an alternative major species on the leeward slopes of the Vancouver Island Ranges
- **Bp** is recommended as a minor species for the lower elevational and southern limits of the subzone on the Pacific Ranges and the leeward slopes of the Vancouver Island Ranges
- **Yc** is an alternative to **Ba** on nutrient very poor to medium sites or on steep slopes

Specific comments:

(Site and Use)

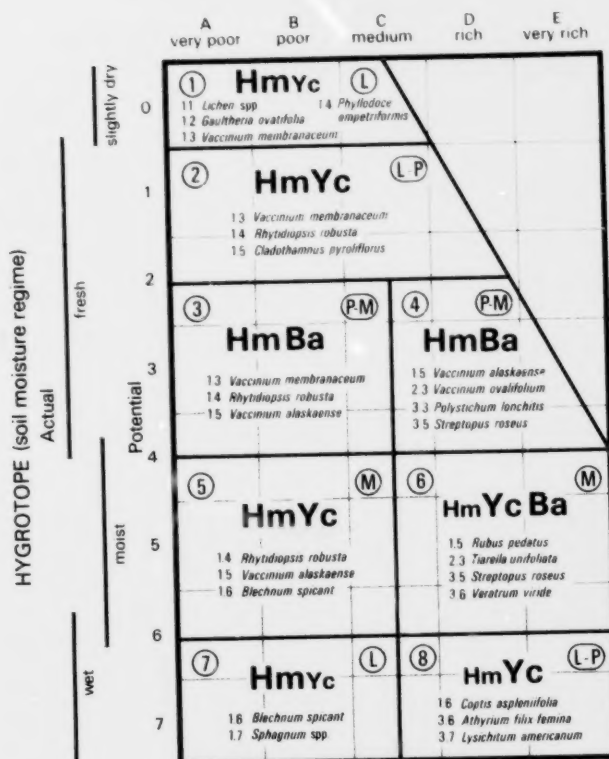
- ① marginal sites for timber production
- ② **Se** is an alternative to **Hm**; **Ba** is an alternative to **Yc**
- ③ **Se** is an alternative to **Hm**; **Yc** is an alternative to **Ba**
- ④ **Se** is an alternative to **Hm**. **Yc** is an alternative to **Ba**. **Bp** can replace **Ba** in part. **Ss** is an acceptable crop species in lower elevations in the northern part of the MHa Subzone (Port Hardy and Bella Coola Forest Districts)
- ⑤ **Ba** is an acceptable minor species
- ⑥ brush hazard sites. **Yc** should be preferred on steep slopes. **Ss** is an acceptable crop species in lower elevations in the northern part of the MHa Subzone (Port Hardy and Bella Coola Forest Districts)
- ⑦ marginal sites for timber production
- ⑧ marginal sites for timber production; the proportion of **Hm** in stand composition will depend on the frequency of acid organic mounds on a site

Grid No. 1

Recommended tree species for the

MHa	MARITIME FORESTED MH SUBZONE
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TROPHOTOPE (soil nutrient regime)



Comments on the Recommended Tree Species for the Submontane Forest
and MH Subzone (MHb) - Grid No. 2.

General comments:

- **Hm** and **Yc** are, in general, less desirable crop species in the eastern limits of the subzone.
- **Se** is a desirable crop species, particularly in the eastern limits of the subzone.
- **Bp** is recommended as a minor crop species in the lower and southern limits of the subzone on nutrient medium to very rich sites.
- advance natural regeneration of **Ba** may provide much of the desired component of this species.
- **Yc** is an alternative to **Ba** on nutrient very poor to medium sites or on steep slopes.

Specific comments:

- ① marginal sites for timber production.
 - ② **Yc** is an alternative to **Ba**.
 - ③ **Se** is an alternative to **Hm**. **Yc** is an alternative to **Ba**.
 - ④ **Hm** is an alternative to **Se**. **Yc** is an alternative to **Ba**. **Bp** can replace **Ba** in part. **Pw** is an acceptable minor species.
 - ⑤ **Ba** is an acceptable minor species.
 - ⑥ brush hazard sites: establishment of a mixed-species stand is desirable. **Yc** is an alternative to **Ba**. **Bp** can replace **Ba** in part.
 - ⑦ marginal sites for timber production.
- marginal sites for timber production. **Bl** is an alternative to **Yc**.

Grid No. 2

Recommended tree species for the

MHb	SUBMARITIME FORESTED MH SUBZONE
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TROPHOTOPE (soil nutrient regime)

		A	B	C	D	E
		very poor	poor	medium	rich	very rich
HYGROTOPE (soil moisture regime)	Actual					
	slightly dry	① HmYc (L)				
		11 <i>Rhododendron fedtschenkoi</i> 12 <i>Gaultheria nivalis</i> 13 <i>Vaccinium membranaceum</i> 14 <i>Phyllocladus integerrima</i>				
	fresh	② SeBa (LP)				
		13 <i>Vaccinium membranaceum</i> 14 <i>Rhododendron arboreum</i> 15 <i>Myrica fruticosa</i>				
	Potential	③ HmBa (PM)	④ SeBa (M)			
		13 <i>Vaccinium membranaceum</i> 14 <i>Rhododendron arboreum</i> 15 <i>Rubus pedatus</i> 23 <i>Vaccinium ovalifolium</i>	13 <i>Vaccinium membranaceum</i> 23 <i>Vaccinium ovalifolium</i> 24 <i>Sorbus stellata</i> 35 <i>Streptopus roseus</i>			
	moist	⑤ HmYc (M)	⑥ SeBa (MG)			
		14 <i>Clintonia uniflora</i> 15 <i>Rubus pedatus</i> 16 <i>Blechnum spicant</i>	15 <i>Rubus pedatus</i> 23 <i>Taraxacum officinale</i> 35 <i>Streptopus roseus</i> 36 <i>Veratrum viride</i>			
	wet	⑦ HmYc (L)	⑧ SeYc (LP)			
		16 <i>Blechnum spicant</i> 17 <i>Sphagnum</i> spp.	36 <i>Veratrum viride</i> 37 <i>Plantago rivularis</i>			

Comments on the Recommended Tree Species for the Subcontinental
Forested ESSF Subzone (ESSF1) and Related Biogeoclimatic Units
- Grid No. 3.

General comments:

- along the eastern regional boundary, there is a marginal occurrence of some continental forested subzones of the ESSF Zone. Ecological differences between these subzones and the ESSF1 Subzone did not necessitate a different choice of species. Therefore, the guidelines pertain to all subalpine, boreal, subcontinental to continental forests within the region.
- **Ba** is an alternative to **Bl** in the western limits of the ESSF1 Subzone.

Specific comments:

- ① marginal sites for timber production
- ② **Se** is an alternative to **Pl**; retain **Bl** as nurse species, not considered for planting
- ③ **Fd** and **Pl** are alternatives to **Se** on south facing slopes in the lower and upper limits of the subzone, respectively
- ④ **Pl** is an alternative to **Se** on slightly dry sites
- ⑤ brush hazard sites, establishment of a mixed species stand is desirable
- ⑥ no comment
- ⑦ brush hazard sites, establishment of a mixed species stand is desirable
- ⑧ marginal sites for timber production
- ⑨ brush hazard sites, **Yc** is an alternative to **Se** or **Bl**

Grid No. 3

Recommended tree species for the

ESSFf	SUBCONTINENTAL FORESTED ESSF SUBZONE AND RELATED UNITS
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TROPHOTOPE (soil nutrient regime)

		A very poor	B poor	C medium	D rich	E very rich
HYGROTOPE (soil moisture regime)	Actual					
	very dry	① PI (L) 11 <i>Larix</i> spp. 13 <i>Picea mariana</i>				
	moderately dry	② PI (L P) 13 <i>Picea mariana</i> 14 <i>Rhytidopsis robusta</i> 21 <i>Vaccinium scoparium</i> 33 <i>Lupinus arcticus</i>	③ SeBI (P) 21 <i>Vaccinium scoparium</i> 22 <i>Prunella racemosa</i> 23 <i>Lonicera utahensis</i> 33 <i>Spirea betulifolia</i>			
	slightly fresh	④ SeBI (PM) 13 <i>Vaccinium membranaceum</i> 14 <i>Rhododendron albiflorum</i> 15 <i>Rubus pedatus</i> 22 <i>Arnica cordifolia</i>	⑤ SeBI (M) 22 <i>Arnica cordifolia</i> 23 <i>Lonicera utahensis</i> 34 <i>Rubus parviflorus</i> 35 <i>Ribes gracile</i>			
	moist	⑥ SeBI (M) 13 <i>Vaccinium membranaceum</i> 14 <i>Rhytidopsis robusta</i> 15 <i>Rubus pedatus</i> 23 <i>Taraxacum officinale</i>	⑦ SeBI (MG) 23 <i>Taraxacum officinale</i> 34 <i>Rubus parviflorus</i> 35 <i>Ribes gracile</i> 36 <i>Valeriana sibirica</i>			
	wet	⑧ PI (L) 17 <i>Sphagnum</i> spp.	⑨ SeBI (PM) 36 <i>Veratrum viride</i> 37 <i>Equisetum sylvaticum</i>			

Comments on the Recommended Tree Species for the Southern Subcontinental IDF Variant (**IDFe1**) and Related Biogeographic Units – **Grid No. 4.**

General comments:

- The IDF Zone is represented mainly by the subcontinental IDFe Subzone. In some areas, the related IDFc and IDFd subzones have been recognized. Ecological differences between these subzones, and the IDFe Subzone did not necessitate different choice of species; therefore, the guidelines pertain to all three subzones. Representative indicator species provided on the grid relate primarily to the IDFe1 Variant.
- **Cw** is applicable only in IDFe Subzone.
- **Bg** is applicable only in the IDFe Subzone south of 50°N latitude.
- on a trial basis, **Lw** is recommended as a minor species in the upper limits of the subzones.

Specific comments:

- ① marginal sites for timber production.
- ② marginal sites for timber production. **Pl** is an alternative to **Py**.
- ③ **Pl** is an alternative to **Fd**. **Lw** is an acceptable minor species. **Cw** can function as a non-crop (nurse) species.
- ④ brush hazard sites. **Lw** is an acceptable minor species. **Py** and **Se** are alternatives to **Fd** in the lower and upper limits of the subzones, respectively.
- ⑤ **Se** is an alternative to **Fd** in the upper limits of the IDFd and IDFe subzones. **Cw** can function as a non-crop (nurse) species.
- ⑥ brush hazard sites; establishment of a mixed species stand is desirable. **Se** is an alternative to **Fd** in the upper limits of the IDFd and IDFe subzones.
- ⑦ alluvial floodplains; high brush hazard sites. **Cw** or **Bg-Cw** mixtures may be used as major species.
- ⑧ marginal sites for timber production.
- ⑨ brush hazard sites.

Grid No. 4

Recommended tree species for the

IDFe1	SOUTHERN SUBCONTINENTAL IDF VARIANT AND RELATED UNITS
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TROPHOTOPE (soil nutrient regime)

		A	B	C	D	E
		very poor	poor	medium	rich	very rich
HYGROTOPE (soil moisture regime)	extremely dry	① PlFd 11 <i>Lichen</i> spp. 12 <i>Chimaphila umbellata</i> 13 <i>Paxistima myrsinites</i> 21 <i>Arctostaphylos uva-ursi</i>	② PyFd 21 <i>Arctostaphylos uva-ursi</i> 31 <i>Agropyron spicatum</i> 32 <i>Mahonia aquifolium</i> 33 <i>Calamagrostis rubescens</i>			
	very dry					
	moderately dry	③ Fd 12 <i>Chimaphila umbellata</i> 13 <i>Paxistima myrsinites</i> 14 <i>Linnaea borealis</i> 22 <i>Amelanchier alnifolia</i>	④ Fdcw 22 <i>Amelanchier alnifolia</i> 32 <i>Mahonia aquifolium</i> 33 <i>Spiraea betulifolia</i> 34 <i>Acer glabrum</i>	⑤ Fd 13 <i>Paxistima myrsinites</i> 14 <i>Hylacomium splendens</i> 23 <i>Taxella unfoliata</i> 33 <i>Pteridium aquilinum</i>	⑥ FdBgCw 33 <i>Rhytidadelphus triquetrus</i> 34 <i>Rubus parviflorus</i> 35 <i>Ribes lacustre</i> 36 <i>Cornus sericea</i>	⑦ ACBgCw
	slightly dry					
	fresh					
	moist	⑧ PI 17 <i>Sphagnum</i> spp.	⑨ BgCw 36 <i>Equisetum</i> spp. 37 <i>Scirpus microcarpus</i>	⑩ PI	⑪ BgCw	⑫ PI
	wet					

Comments on the Recommended Tree Species for the Central Subcontinental IDF Variant (**IDFe2**) and Related Biogeoclimatic Units **Grid No. 5.**

General comments:

- undifferentiated continental subzones of the IDF may occur to the east of the IDFe2 Variant. Ecological similarity amongst all these units precludes the necessity for a different choice of tree species; therefore the guidelines pertain to all units.
- representative indicator species provided in the grid relate primarily to the IDFe2 Variant.
- information presented in this grid should be considered provisional due to limited data.
- **Ss** is susceptible to Sitka spruce weevil (*Pissodes stroby* (Peck)).

Specific comments:

- ① marginal sites for timber production
- ② marginal sites for timber production
- ③ **Pl** is an alternative to **Fd**
- ④ **Pl** is an alternative minor species. **Se** is an alternative to **Fd** in the upper limits of the variant.
- ⑤ **Se** is an alternative to **Fd** in the upper limits of the variant.
- ⑥ brush hazard sites; establishment of a mixed-species stand is desirable; **Ss** is an acceptable minor species.
- ⑦ alluvial floodplains, high brush hazard sites; **Cw** or **Cw-Ss** mixtures may be used as major species.
- ⑧ marginal sites for timber production
- ⑨ brush hazard sites; **Ss** is an acceptable minor species on raised mounds.

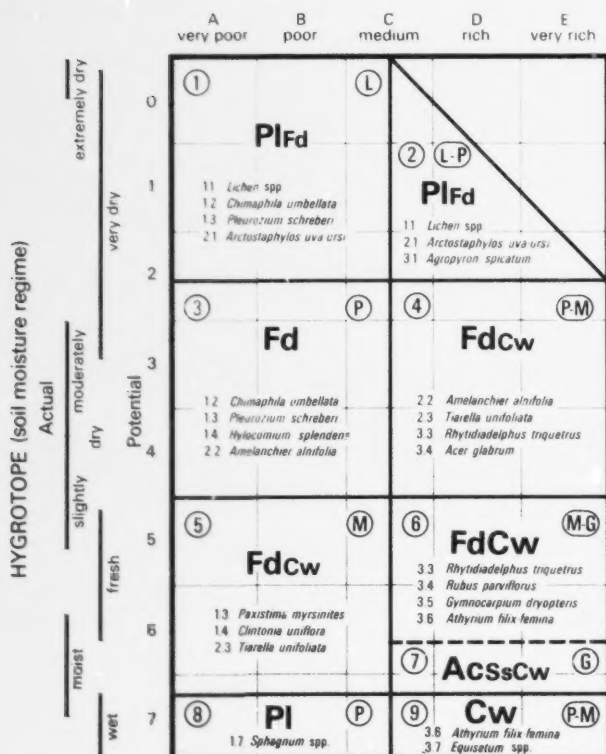
Grid No. 5

Recommended tree species for the

IDFe2

**CENTRAL SUBCONTINENTAL IDF
VARIANT AND RELATED UNITS**

TROPHOTOPE (soil nutrient regime)



Comments on the Recommended Tree Species for the **CDF** Zone -
Grid No. 6.

General comments:

- where recommended **Cw** **Pw** **Lw** (on a trial basis) in the CDFb Subzone and **Py** (on a trial basis) in the CDFa Subzone are alternatives to **Fd** on sites affected by laminated root rot (*Phellinus* *weiri* (Murr.) Gilbertson).

Specific comments:

(Site 1 and 2)

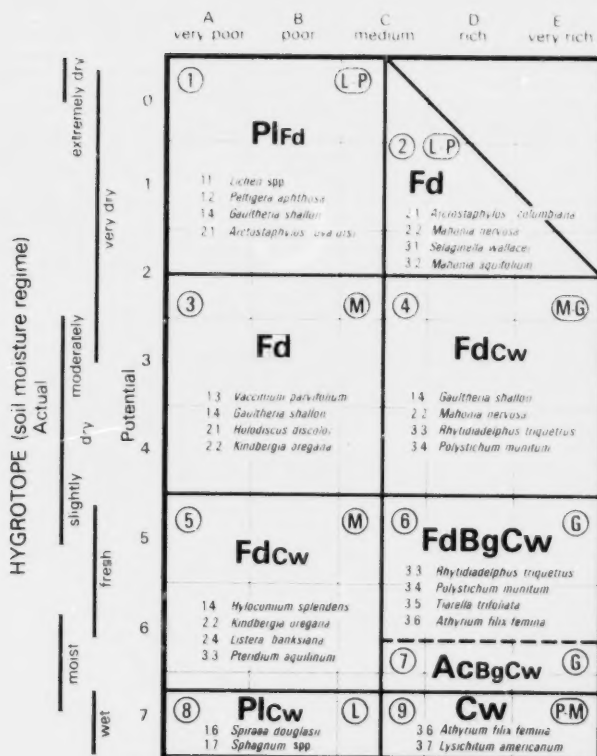
- ① marginal sites for timber production
- ② marginal sites for timber production. **Pl** or **Py** in the CDFa Subzone and **Pl** or **Lw** in the CDFb Subzone are alternatives to **Fd**
- ③ **Cw** can function as a non-crop (nurse) species to suppress a lower shrub layer of salal. **Lw** or **Pl** are alternatives to **Fd**
- ④ **Py** in the CDFa Subzone and **Lw** or **Pw** in the CDFb Subzone are alternatives to **Fd**. **Bg** is an acceptable minor species
- ⑤ no comment
- ⑥ brush hazard sites. establishment of a mixed species stand is desirable
- ⑦ alluvial floodplains. high brush hazard sites. **Bg-Cw** mixtures may be used as major species
- ⑧ marginal sites for timber production
- ⑨ brush hazard sites. **Hw** is an acceptable minor species on acid organic mounds

Grid No. 6

Recommended tree species for the

CDF	CDF ZONE
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TROPHOTOPE (soil nutrient regime)



Comments on the Recommended Tree Species for the Vancouver Island Drier Maritime CWH Variant (CWHa1) – Grid No. 7.

General Comments:

- **Lw** is recommended on a trial basis as a minor species on dry sites
- where recommended **Cw** (as a major species) or **Lw** and **Pw** (as minor species) are alternatives to **Fd** on sites affected by laminated root rot
- **Ss** is susceptible to Sitka spruce weevil

Specific Comments:

- ① marginal sites for timber production
- ② **Pl** is an alternative to **Fd**. **Lw** is an acceptable minor species. **Cw** can function as a non-crop (nurse) species to suppress a lower shrub layer of salal.
- ③ **Lw** or **Pw** are acceptable minor species
- ④ **Hw** is an alternative to **Fd** in the wettest part of the variant. **Fd-Hw** mixtures, however, are not recommended. – **Fd** should be used as a minor to **Hw** or **Hw** as a minor to **Fd**. Inclusion of **Cw** is desirable to both **Hw** or **Fd**.
- ⑤ **Pw** is an acceptable minor species
- ⑥ **Fd** is an acceptable minor species
- ⑦ brush hazard sites – establishment of a mixed-species stand is desirable
- ⑧ alluvial floodplains, high brush hazard sites. **Cw** or **Bg-Cw** mixtures may be used as major species
- ⑨ marginal sites for timber production
- ⑩ brush hazard sites. **Pw** and **Ss** are acceptable minor species. **Hw** (natural) is an acceptable minor species, depending on the frequency of acid organic mounds on the site

Grid No. 7

Recommended tree species for the

CWHa1	VANCOUVER ISLAND DRIER MARITIME CWH VARIANT
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TROPHOTOPE (soil nutrient regime)

		A	B	C	D	E
		very poor	poor	medium	rich	very rich
HYGROTOPE (soil moisture regime)	Actual					
	very dry	① PlFd 11 <i>Lechen sop</i> 13 <i>Vaccinium parvifolium</i> 14 <i>Gaultheria shallon</i> 21 <i>Holodiscus discolor</i>	② Fd 13 <i>Vaccinium parvifolium</i> 14 <i>Gaultheria shallon</i> 21 <i>Holodiscus discolor</i> 22 <i>Kindbergia oregana</i>			
	moderately dry		③ Fdcw 22 <i>Mahonia nervosa</i> 32 <i>Symphoricarpos hesperus</i> 33 <i>Rhytidadelphus triquetrus</i> 34 <i>Polystichum munitum</i>			
	dry			④ Fdcw (PM) 13 <i>Vaccinium parvifolium</i> 14 <i>Hylocomium splendens</i> 15 <i>Rhytidadelphus loreus</i> 22 <i>Kindbergia oregana</i>	⑤ FdCw (M) 14 <i>Hylocomium splendens</i> 22 <i>Kindbergia oregana</i> 33 <i>Pteridium aquilinum</i> 34 <i>Polystichum munitum</i>	
	slightly				⑥ HwCw (M) 14 <i>Hylocomium splendens</i> 15 <i>Rhytidadelphus loreus</i> 16 <i>Blechnum spicant</i>	⑦ FdBgCw (G) 34 <i>Polystichum munitum</i> 35 <i>Tarella trifoliata</i> 36 <i>Athyrium filix femina</i>
	fresh					⑧ ACBgCw (G)
	moist					⑩ CWHw (PM) 36 <i>Athyrium filix femina</i> 37 <i>Lysichiton americanum</i>
	wet	⑨ Plcw 16 <i>Spruce douglasii</i> 17 <i>Sphagnum spp.</i>				
	Potential					

Comments on the Recommended Tree Species for the Pacific Ranges
Drier Maritime CWH Variant (CWHa2) - Grid No. 8.

General comments:

- **Lw** is recommended on a trial basis as a minor crop species on dry sites
- where recommended **Cw** (as a major species) or **Lw** and **Pw** (as minor species) are alternatives to **Fd** on sites affected by laminated root rot
- **Ss** susceptible to Sitka spruce weevil

Specific comments:

- ① marginal sites for timber production
- ② **Cw** can function as a non-crop (nurse) species to suppress a lower shrub layer of salal. **Lw** is an acceptable minor species
- ③ **Lw** and **Pw** are acceptable minor species. **Cw** can function as a non-crop species to suppress a lower shrub layer of salal
- ④ **Hw** is an alternative to **Fd** in the wettest parts of the variant. **Fd-Hw** mixtures, however, are not recommended. **Fd** should be used as a minor to **Hw** or **Hw** as a minor to **Fd**. Inclusion of **Cw** is desirable to both **Hw** or **Fd**
- ⑤ **Pw** is an acceptable minor species
- ⑥ **Fd** is an acceptable minor species
- ⑦ brush hazard sites, establishment of a mixed-species stand is desirable
- ⑧ alluvial floodplains, high brush hazard sites: **Cw** or **Bg-Cw** mixtures may be used as major species
- ⑨ marginal sites for timber production
- ⑩ brush hazard sites. **Pw** and **Ss** are acceptable minor species. **Hw** (natural) is an acceptable minor species, depending on the frequency of acid organic mounds on the site

Recommended tree species for the

PACIFIC RANGES DRIER MARITIME
CWH VARIANT

HYGROTOPE (soil moisture regime)



Comments on the Recommended Tree Species for the Windward Submontane Maritime Wetter CWH Variant (CWHb1) - Grid No. 9.

General comments:

- the application of **Fd** should be restricted to the southern part of the variant (south of Brooks Peninsula and Seymour Inlet) and based on some evidence of its presence in the local area
- there is potential for widespread application of **Ss** on nutrient-medium to very rich sites in the northern part of the variant (north of Brooks Peninsula and Seymour Inlet)
- *Gaultheria shallon* replaces *Hylocomium splendens* as representative species for EISG 1.4 in site units 3 and 5 on western and northern Vancouver Island

Specific comments:

Site unit no.

- ① marginal sites for timber production. **Fd** is an alternative to **Pi**
- ② **Fd** is an alternative to **Hw**. **Ss** is an acceptable minor species on nutrient-medium sites
- ③ **Ss** is an acceptable major species on nutrient-medium sites
- ④ **Fd** or **Ss** are alternatives to **Hw**
- ⑤ **Ss** is an acceptable minor species on nutrient-medium sites; the distribution of **Hw** should be related to acid organic mounds
- ⑥ brush hazard sites; establishment of a mixed-species stand is desirable. **Cw** is preferable on steep slopes. **Hw** is an acceptable minor species
- ⑦ alluvial floodplains; high brush hazard sites; establishment of a mixed-species stand is desirable; the application of **Ac** as an alternative to coniferous species should be based on some evidence of its presence in the local area
- ⑧ marginal sites for timber production
- ⑨ brush hazard sites. **Hw** is an acceptable minor species, depending on the frequency of acid organic mounds on the site

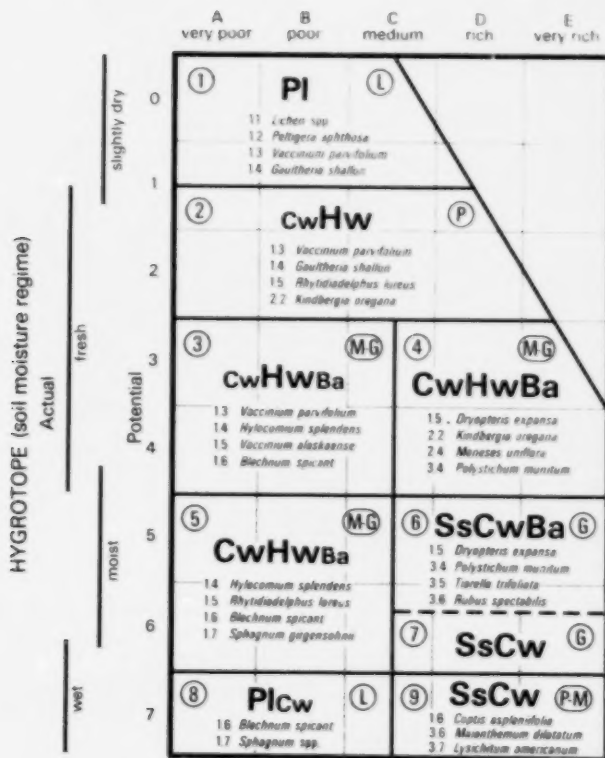
Grid No. 9

Recommended tree species for the

CWHb1

**WINDWARD SUBMONTANE MARITIME
WETTER CWH VARIANT**

TROPHOTOPE (soil nutrient regime)



Comments on the Recommended Tree Species for the Windward
Montane Maritime Wetter CWH Variant (CWHb2) – Grid No. 10.

General comments:

- the application of **Fd** and **Pw** should be restricted to the southern part of the variant, based on some evidence of its presence in the local area
- there is potential for widespread application of **Ss** on nutrient medium to very rich sites in the northern part of the variant (north of Brooks Peninsula and Seymour Inlet)
- advance natural regeneration of **Ba**, **Hw**, **Cw** and **Yc** may provide much of the desired component of those species
- **Yc** is an alternative to **Cw** in the upper limit of the variant
- **Bp** is an alternative to **Ba** on nutrient medium to very rich sites south of 60° N latitude

Specific comments:

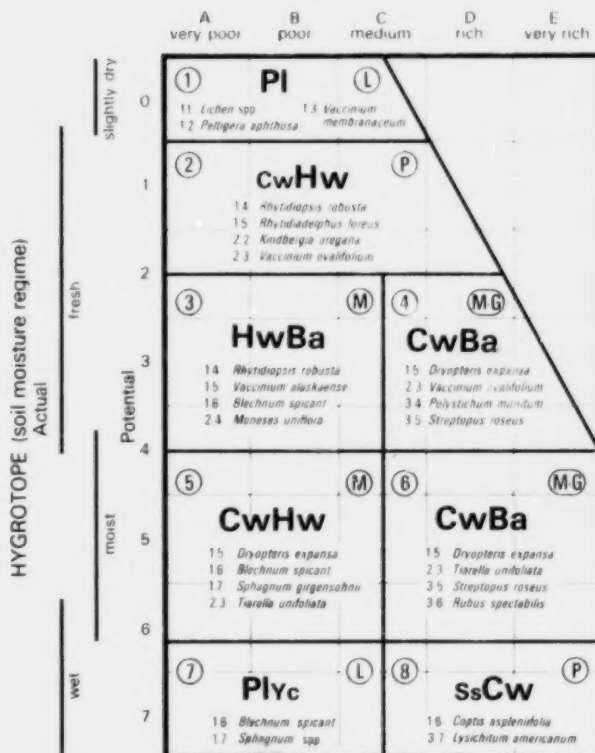
- ① marginal sites for timber production. **Fd** is an alternative to **Pl**
- ② **Fd** is an alternative to **Hw** on south facing slopes. **Pw** or **Ss** are acceptable minor species on nutrient medium sites
- ③ **Cw** is an acceptable minor species or alternative to **Ba** on steep slopes. **Ss** is an acceptable major species on nutrient medium sites
- ④ **Fd** is an alternative to **Ba** on south facing slopes. **Ss-Hw** is an alternative to **Cw-Ba**. **Pw** is an acceptable minor species
- ⑤ **Ba** is an acceptable minor species or alternative to **Cw**. **Ss** is an acceptable major species on nutrient medium sites
- ⑥ brush hazard sites: establishment of a mixed species stand is desirable. **Ss** is an acceptable minor species or alternative to **Ba**. **Hw** is an acceptable minor species
- ⑦ marginal sites for timber production
- ⑧ **Hw** is an acceptable minor species, depending on the frequency of acid organic mounds on the site

Grid No. 10

Recommended tree species for the

CWHb2	WINDWARD MONTANE MARITIME WETTER CWH VARIANT
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TROPHOTOPE (soil nutrient regime)



Comments on the Recommended Tree Species for the Leeward Submontane Moist Wetter CWH Variant (CWHb3) - Grid No. 11.

General comments:

-- **Lw** is recommended on a trial basis as a minor species on dry sites.

Specific comments:

- ① marginal sites for timber production.
- ② **Cw** can function as a non-crop, nursery species to suppress a low shrub layer of salal. **Lw** is an acceptable minor species.
- ③ **Lw** is an alternative species to **Pw**. **Cw** is an acceptable non-crop species (cf. site unit 2).
- ④ **Hw** may be chosen as a major species and **Fd** may be excluded or chosen as a minor species. E.g., on fresh, north-facing sites, **Cw** is an acceptable minor species.
- ⑤ **Pw** and **Hw** are acceptable minor species.
- ⑥ **Ba** is an acceptable minor species.
- ⑦ brush hazard sites; establishment of a mixed-species stand is desirable.
- ⑧ alluvial floodplains; high brush hazard sites. **Cw** or **Cw-Ba** mixtures may be used as major species.
- ⑨ marginal sites for timber production.
- ⑩ brush hazard sites. **Pw** is an alternative to **Ss**. **Hw** is an acceptable minor species, depending on the frequency of acid organic mounds on the site.

Grid No. 11

Recommended tree species for the

CWHb3	LEEWARD SUBMONTANE MARITIME WETTER CWH VARIANT
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TROPHOTOPE (soil nutrient regime)

		A very poor	B poor	C medium	D rich	E very rich	
HYGROTOPE (soil moisture regime)	very dry	① PlFd 11 <i>Lichen</i> spp. 12 <i>Chimaphila umbellata</i> 13 <i>Pleurozium schreberi</i>	① L 14 <i>Gaultheria shallon</i>				
		② Fd 12 <i>Chimaphila umbellata</i> 13 <i>Vaccinium parvifolium</i> 14 <i>Gaultheria shallon</i> 22 <i>Kindbergia oregana</i>	① L-P	③ L-P PwFd 14 <i>Gaultheria shallon</i> 22 <i>Mahonia nervosa</i> 33 <i>Rhytidaleighus triquetrus</i> 34 <i>Achlys triphylla</i>			
	moderately dry	④ FdHw 13 <i>Orthilia secunda</i> 14 <i>Hylacomium splendens</i> 15 <i>Vaccinium alaskaense</i> 23 <i>Vaccinium ovalifolium</i>	⑤ M	⑤ Fdcw ⑤ M 22 <i>Kindbergia oregana</i> 33 <i>Prepidium aequilinum</i> 34 <i>Achlys triphylla</i> 35 <i>Tiarella trifoliata</i>			
		⑥ HwCw ⑥ M-G 14 <i>Hylacomium splendens</i> 15 <i>Dryopteris expansa</i> 16 <i>Blechnum spicant</i> 23 <i>Vaccinium ovalifolium</i>	⑦ FdCwBa ⑦ G 15 <i>Rubus pedatus</i> 34 <i>Polystichum munifolium</i> 35 <i>Tiarella trifoliata</i> 36 <i>Athyrium filix femina</i>				
	slightly dry	⑧ Plcw ⑧ L 16 <i>Blechnum spicant</i> 17 <i>Sphagnum</i> spp.	⑩ ssCw ⑩ P-M 36 <i>Athyrium filix femina</i> 37 <i>Lyaschitum americanum</i>				
		⑨ Plcw ⑨ L 16 <i>Blechnum spicant</i> 17 <i>Sphagnum</i> spp.	⑩ ssCw ⑩ P-M 36 <i>Athyrium filix femina</i> 37 <i>Lyaschitum americanum</i>				
	fresh	⑨ Plcw ⑨ L 16 <i>Blechnum spicant</i> 17 <i>Sphagnum</i> spp.	⑩ ssCw ⑩ P-M 36 <i>Athyrium filix femina</i> 37 <i>Lyaschitum americanum</i>				
		⑨ Plcw ⑨ L 16 <i>Blechnum spicant</i> 17 <i>Sphagnum</i> spp.	⑩ ssCw ⑩ P-M 36 <i>Athyrium filix femina</i> 37 <i>Lyaschitum americanum</i>				
	moist	⑨ Plcw ⑨ L 16 <i>Blechnum spicant</i> 17 <i>Sphagnum</i> spp.	⑩ ssCw ⑩ P-M 36 <i>Athyrium filix femina</i> 37 <i>Lyaschitum americanum</i>				
		⑨ Plcw ⑨ L 16 <i>Blechnum spicant</i> 17 <i>Sphagnum</i> spp.	⑩ ssCw ⑩ P-M 36 <i>Athyrium filix femina</i> 37 <i>Lyaschitum americanum</i>				
wet	⑨ Plcw ⑨ L 16 <i>Blechnum spicant</i> 17 <i>Sphagnum</i> spp.	⑩ ssCw ⑩ P-M 36 <i>Athyrium filix femina</i> 37 <i>Lyaschitum americanum</i>					
	⑨ Plcw ⑨ L 16 <i>Blechnum spicant</i> 17 <i>Sphagnum</i> spp.	⑩ ssCw ⑩ P-M 36 <i>Athyrium filix femina</i> 37 <i>Lyaschitum americanum</i>					

Comments on the Recommended Tree Species for the Leeward Montane Maritime Wetter CWH Variant (CWHb4) - Grid No. 12.

General comments:

- on a trial basis, **Lw** (as minor species) and **Se** and **Bp** are recommended as crop species
- **Yc** is an alternative to **Cw** however, both species can be used on the same site
- **Cw** is an alternative to **Ba** on nutrient very poor to medium sites or on steep slopes

Specific comments:

Site grid no.

- ① marginal sites for timber production
- ② **Lw** or **Se** are alternatives to **Fd**. **Cw** can function as a non-crop (nurse) species
- ③ **Lw** or **Se** are alternatives to **Fd**
- ④ **Fd** is an alternative to **Hw** on south facing slopes. **Cw** is an alternative to **Ba**. **Se** is an alternative to **Hw**
- ⑤ establishment of a mixed-species stand is desirable. **Fd** or **Se** are alternatives to **Hw** on south facing slopes. **Cw** is an alternative to **Ba**. **Bp** is an alternative to **Ba**. **Pw** is an acceptable minor species
- ⑥ **Bp** or **Ba** are acceptable minor species on nutrient-medium sites
- ⑦ brush hazard sites, establishment of a mixed-species stand is desirable. **Hw** is an acceptable minor species. **Fd** is an acceptable minor species on steep south facing slopes
- ⑧ marginal sites for timber production
- ⑨ brush hazard sites: **Pw** or **Ss** are alternative minor species. **Hw** is an acceptable minor species, depending on the frequency of acid mound organic mounds on the site

Grid No. 12

Recommended tree species for the:

CWHb4	LEEWARD MONTANE MARITIME WETTER CWH VARIANT
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TROPHOTOPE (soil nutrient regime)

		A	B	C	D	E
		very poor	poor	medium	rich	very rich
HYGROTOPE (soil moisture regime)	very dry	① PlFd 1.1 <i>Lichen</i> spp. 1.2 <i>Gaultheria ovalifolia</i> 1.3 <i>Pleurozium schreberi</i>	② Fd 1.2 <i>Chimaphila umbellata</i> 1.3 <i>Vaccinium parvifolium</i> 1.4 <i>Rhytidopsis robusta</i> 1.5 <i>Vaccinium alaskaense</i>	③ PwFd 1.3 <i>Vaccinium parvifolium</i> 2.2 <i>Mahonia nervosa</i> 2.3 <i>Vaccinium ovalifolium</i> 3.4 <i>Achlys triphylla</i>		
	moderately dry	④ HwBa 1.3 <i>Orthilia secunda</i> 1.4 <i>Rhytidopsis robusta</i> 1.5 <i>Vaccinium alaskaense</i> 2.3 <i>Vaccinium ovalifolium</i>	⑤ HwBa 2.3 <i>Vaccinium ovalifolium</i> 2.4 <i>Luzula parviflora</i> 3.4 <i>Achlys triphylla</i> 3.5 <i>Tiarella trifoliata</i>			
	slightly dry	⑥ HwCw 1.4 <i>Clinotoma uniflora</i> 1.5 <i>Rubus pedatus</i> 1.6 <i>Blechnum spicant</i> 2.4 <i>Luzula parviflora</i>	⑦ CwBa 1.5 <i>Rubus pedatus</i> 3.4 <i>Polystichum munitum</i> 3.5 <i>Stratiopus roseus</i> 3.6 <i>Rubus spectabilis</i>			
	fresh	⑧ Pl 1.6 <i>Blechnum spicant</i> 1.7 <i>Sphagnum</i> spp.	⑨ Cw			
	Potential					
	moist					
	wet					

Comments on the Recommended Tree Species for the Southern Sub-maritime Wetter CWH Variant (CWHb5) – Grid No. 13.

General comments:

- **Hw** and **Yc** are, in general, less desirable species in the eastern limits of the variant
- **Se** is an alternative to, or can be used as, a major species with **Fd** in the upper, eastern limits of the variant
- **Lw** is recommended, on a trial basis as a minor species in the eastern limits of the variant
- **Bg** may be used as minor or major species in the western limits of the variant south of 50°N latitude
- **Bp** is recommended as a minor species on nutrient medium to very rich sites

Specific comments:

Site Grid No.

- ① marginal sites for timber production
- ② **Se** is an alternative to **Fd** **Lw** is an acceptable minor species. **Cw** can function as a non-crop (nurse) species
- ③ **Lw** and **Pw** are acceptable minor species **Se** is an alternative to **Fd**
- ④ **Se** or **Hw** are alternatives to **Fd** on dry and fresh sites, respectively **Ba** or **Bp** are alternatives to **Cw**
- ⑤ **Lw** and **Pw** are acceptable minor species **Se** is an alternative to **Fd** **Ba** or **Bp** are alternatives to **Cw**
- ⑥ **Pa** and **Yc** are alternatives to **Cw** in the upper, western limits of the variant
- ⑦ brush hazard sites, establishment of a mixed-species stand is desirable **Se-Ba** is an alternative to **Fd-Cw** mixture. **Ba**, **Bg**, or **Bp** are alternatives to **Cw**
- ⑧ alluvial floodplains, high brush hazard sites. **Cw**, **Se-Ba**, **Se-Cw**, or **Cw-Ba** mixtures may be used as major species
- ⑨ marginal sites for timber production
- ⑩ **Yc** can replace **Cw** in upper, western limits of the variant. **Bl** is an alternative to **Cw**. **Pw** is an acceptable minor species

Grid No. 13

Recommended tree species for the

CWHb5

**SOUTHERN SUBMARITIME WETTER
CWH VARIANT**

TROPHOTOPE (soil nutrient regime)

HYGROTOPE (soil moisture regime)

A very poor B poor C medium D rich E very rich

Actual

moist

fresh

slightly dry

moderately dry

Potential

very dry

0	① PI 11 <i>Lichen</i> spp. 12 <i>Peltigera aphthosa</i> 13 <i>Paxistima myrsinoides</i>	② L 21 <i>Arctostaphylos uva-ursi</i>
1	② Fd 12 <i>Chimaphila umbellata</i> 13 <i>Pleurozium schreberi</i> 14 <i>Hylacomium splendens</i> 21 <i>Arctostaphylos uva-ursi</i>	③ P ③ P Fdcw 21 <i>Arctostaphylos uva-ursi</i> 23 <i>Vaccinium ovalifolium</i> 33 <i>Rhytidadelphus triquetrus</i> 34 <i>Smilacina stellata</i>
2		
3	④ Fdcw (M) 13 <i>Vaccinium membranaceum</i> 14 <i>Rhytidopsis robusta</i> 15 <i>Rubus pedatus</i> 23 <i>Vaccinium ovalifolium</i>	⑤ Fdcw (M) 23 <i>Vaccinium ovalifolium</i> 33 <i>Rhytidadelphus triquetrus</i> 34 <i>Smilacina stellata</i> 35 <i>Streptopus roseus</i>
4		
5	⑥ HwCw (M) 14 <i>Rhytidopsis robusta</i> 15 <i>Rubus pedatus</i> 16 <i>Blechnum spicant</i> 23 <i>Tarrelia unifoliata</i>	⑦ FdCw (M-G) 23 <i>Tarrelia unifoliata</i> 34 <i>Smilacina stellata</i> 35 <i>Gymnocarpium dryopteris</i> 36 <i>Athyrium filix femina</i>
6		⑧ ACseCw (G)
7	⑨ PlCw (L) 16 <i>Blechnum spicant</i> 17 <i>Sphagnum</i> spp.	⑩ seCw (P-M) 36 <i>Athyrium filix femina</i> 37 <i>Lysichitum americanum</i>

Comments on the Recommended Tree Species for the Central Submontane Lower Western CWH Variant (CWHb6) – Grid No. 14.

General comments:

- **Se** is an alternative to **Ss** in the eastern and upper limits of the variant.
- **Ss** is susceptible to Sitka spruce weevil.
- information presented in this grid should be considered provisional due to limited data.

Specific comments:

- ① marginal sites for timber production.
- ② **Pl** is an alternative to **Fd**. **Cw** can function as a non-crop (nurse) species.
- ③ **Pl** is an alternative to **Fd**.
- ④ **Hw** is an acceptable major species on fresh sites.
- ⑤ **Ba** is an alternative to **Fd** on fresh sites, particularly on northerly aspects. **Cw** is more suitable on steep slopes. **Ss** is an acceptable minor species.
- ⑥ **Fd** is an alternative to **Hw**. **Ba** is an acceptable minor species.
- ⑦ brush hazard sites: establishment of a mixed species stand is desirable. **Ba** is an alternative to **Fd** particularly on northerly aspects. **Cw** is more suitable on steep slopes.
- ⑧ alluvial floodplains, high brush hazard sites. **Cw-Ba** or **Cw-Ba (Ss)** may be used instead of **Ac**.
- ⑨ marginal sites for timber production.
- ⑩ **Hw** is an alternative minor species depending on the frequency of acid organic mounds on the site.

Recommended tree species for the

CENTRAL SUBMARITIME LOWER
WETTER CWH VARIANT

HYGROTOPE (soil moisture regime)



Comments on the Recommended Tree Species for the Central Submontane Upper Wetter CWH Variant (CWHb7) - Grid No. 15.

General comments:

- **Bl** is an alternative to **Ba** on sites influenced by cold air outflow from glaciers.
- the application of **Fd** should be based on some evidence of its presence in the local area.
- **Yc** is an alternative to **Cw** particularly in upper ranges of the variant.
- information presented in this grid should be considered provisional due to limited data.

Specific comments:

- ① marginal sites for timber production
- ② **Fd** or **Se** are alternatives to **Hw**
- ③ **Fd** is an alternative to **Se**. **Bl** is an alternative to **Cw** in upper ranges of the variant and on sites influenced by cold air drainage. **Hw** is an acceptable minor species.
- ④ **Se** is an alternative to **Hw** on nutrient medium sites. **Cw** or **Yc** (upper elevations) is an alternative major species on steep slopes.
- ⑤ establishment of a mixed species stand is desirable. **Cw** or **Yc** (upper elevations) are alternatives to **Ba** on steep slopes. **Fd-Cw** is an alternative to **Se-Ba** at lower elevations. **Hw** is an acceptable minor species.
- ⑥ **Ba** is an alternative major species.
- ⑦ brush hazard sites: establishment of a mixed species stand is desirable. **Cw** or **Yc** (upper elevations) are alternatives to **Ba** on steep slopes.
- ⑧ alluvial floodplains: high brush hazard sites: establishment of a mixed species stand is desirable. **Ac** is an alternative to coniferous mixtures.
- ⑨ marginal sites for timber production.
- ⑩ **Hw** is an alternative minor species depending on the frequency of acid organic mounds on the site.

Grid No. 15

Recommended tree species for the

CWHb7

**CENTRAL SUBMARITIME UPPER
WETTER CWH VARIANT**

TROPHOTOPE (soil nutrient regime)

HYGROTOPE (soil moisture regime)

Actual

moist

wet

fresh

slightly dry

moderately very dry

Potential

		A very poor	B poor	C medium	D rich	E very rich
0	① PI (L)	11 <i>Lichen</i> spp. 12 <i>Chimaphila umbellata</i> 21 <i>Arctostaphylos uva-ursi</i>				
1	② Hwcw (L P)	12 <i>Peltigera aphthosa</i> 13 <i>Pleurozium schreberi</i> 14 <i>Hylacomium splendens</i> 23 <i>Vaccinium ovalifolium</i>	③ SeCw (P)			
2			13 <i>Pleurozium schreberi</i> 23 <i>Vaccinium ovalifolium</i> 33 <i>Rhytidadelphus triquetrus</i> 34 <i>Acer glabrum</i>			
3	④ HwBa (M)	13 <i>Vaccinium membranaceum</i> 14 <i>Hylacomium splendens</i> 15 <i>Vaccinium alaskaense</i> 23 <i>Vaccinium ovalifolium</i>	⑤ SeBa (M)			
4			15 <i>Dryopteris expansa</i> 23 <i>Vaccinium ovalifolium</i> 34 <i>Smilacina stellata</i> 35 <i>Streptopus roseus</i>			
5	⑥ HwCw (M)	14 <i>Rhytidopsis robusta</i> 15 <i>Vaccinium alaskaense</i> 16 <i>Blechnum spicant</i> 23 <i>Tsarella unifoliata</i>	⑦ SeHwBa (M G)			
6			14 <i>Clintonia uniflora</i> 15 <i>Dryopteris expansa</i> 35 <i>Streptopus roseus</i> 36 <i>Oplapanax horridus</i>			
7	⑨ Plcw (L)	16 <i>Blechnum spicant</i> 17 <i>Sphagnum</i> spp.	⑧ SeCwBa (G)	⑩ SeCw (P M)		
				36 <i>Veratrum viride</i> 37 <i>Lysichitum americanum</i>		

Comments on the Recommended Tree Species for the Southern Drier Submarine CWH Variant (CWHc1) – Grid No. 16.

General comments:

- **Hw** is, in general, a less desirable crop species
- **Bp**, **Lw** and **Py** are recommended as minor species on a trial basis in the eastern limits of the variant
- **Bg** should only be applied south of 50° N latitude

Specific comments:

- ① marginal sites for timber production
- ② **Py** is an alternative to **Fd**
- ③ **Pl** is an alternative to **Fd** on moderately dry sites. **Lw** is an acceptable minor species
- ④ brush hazard sites. **Se** is an alternative to **Fd** in the upper limits of the variant. **Bp** or **Pw** are alternatives to **Cw** in the upper limits of the subzone on slightly dry to fresh sites. **Lw** or **Py** are acceptable minor species on moderately dry sites
- ⑤ **Fd** is an alternative to **Hw** in the eastern limits of the variant
- ⑥ brush hazard sites: establishment of a mixed-species stand is desirable. **Bp** is an alternative to **Bg** in the upper limits of the subzone
- ⑦ alluvial floodplains; high brush hazard sites. **Cw** or **Bg-Cw** mixtures may be used as major species
- ⑧ marginal sites for timber production
- ⑨ brush hazard sites

Grid No. 16

Recommended tree species for the

CWHc1	SOUTHERN DRIER SUBMARITIME CWH VARIANT
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TROPHOTOPE (soil nutrient regime)

		A very poor	B poor	C medium	D rich	E very rich
HYGROTOPE (soil moisture regime) Actual	very dry	① PI 11 <i>Lichen</i> spp. 12 <i>Chimaphila umbellata</i> 13 <i>Pleurozium schrebii</i> 21 <i>Acrostaphylos uva ursi</i>	② L P 21 <i>Holodiscus discolor</i> 22 <i>Kauloiga elegans</i> 31 <i>Seiagella wallicae</i> 32 <i>Mahonia aquifolium</i>	③ Fd		
	moderately dry	③ Fdcw 12 <i>Chimaphila umbellata</i> 13 <i>Paxistima myrsinites</i> 14 <i>Hylacomium splendens</i> 33 <i>Rhyidiadelphus triquetrus</i>	④ Fdcw 22 <i>Mahonia nervosa</i> 23 <i>Tarrelia unifoliata</i> 33 <i>Rhyidiadelphus triquetrus</i> 34 <i>Acropladium</i>			
	slightly dry	⑤ Hwcw 14 <i>Hylacomium splendens</i> 15 <i>Dryopteris expansa</i> 23 <i>Tarrelia unifoliata</i> 24 <i>Listera banksiana</i>	⑥ FdBgCw 23 <i>Tarrelia unifoliata</i> 34 <i>Saxifraga racemosa</i> 35 <i>Gymnocarpium dryopteris</i> 36 <i>Oplopanax horridus</i>	⑦ ACBgCw		
	fresh	⑧ Plcw 17 <i>Sphagnum</i> spp.	⑨ Cw			
	moist	⑩ Plcw	⑪ Cw	⑫ Plcw		
	wet	⑬ Plcw	⑭ Cw			
				⑮ Plcw		

Comments on the Recommended Tree Species for the Central Drier Sub-
maritime CWH Variant (**CWHc2**) – Grid No. 17.

General comments:

- **Se** may be more suitable than **Ss** in the eastern, upper limits of the variant.
- **Ss** susceptible to Sitka spruce weevil.
- information presented in this grid should be considered provisional due to limited data.

Specific comments:

- ① marginal sites for timber production
- ② **Pl** is an alternative to **Fd**
- ③ **Pl** is an alternative to **Fd** on moderately dry sites
- ④ **Pl** is an alternative to **Fd** on moderately dry sites. **Ss** is an alternative minor species
- ⑤ **Fd** is an alternative to **Hw**
- ⑥ brush hazard sites. establishment of a mixed species stand is desirable. **Ss** is an alternative major species
- ⑦ alluvial floodplains, high brush hazard sites. **Cw** may be used as a major species (with **Ss** as a minor species)
- ⑧ marginal sites for timber production
- ⑨ brush hazard sites

Grid No. 17

Recommended tree species for the

CWHc2	CENTRAL DRIER SUBMARITIME CWH VARIANT
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TROPHOTOPE (soil nutrient regime)

		A very poor	B poor	C medium	D rich	E very rich
HYGROTOPE (soil moisture regime)	Actual					
	very dry	0 ① PI 11 <i>Lichen</i> spp. 13 <i>Pleurozium schreberi</i> 14 <i>Hylocomium splendens</i> 21 <i>Arctostaphylos uva-ursi</i>	① L		② Fd 12 <i>Peltandra apiculata</i> 21 <i>Arctostaphylos uva-ursi</i> 22 <i>Asplenium adnigrum</i>	
	moderately dry	2 ③ Fdcw 12 <i>Chimaphila umbellata</i> 13 <i>Pleurozium schreberi</i> 14 <i>Hylocomium splendens</i> 33 <i>Rhytidadelphus triquetrus</i>	④ (PM)		④ Fdcw 14 <i>Hylocomium splendens</i> 22 <i>Asplenium adnigrum</i> 33 <i>Rhytidadelphus triquetrus</i> 34 <i>Acer glabrum</i>	④ (PM)
	slightly dry	3				
	Potential	4				
	fresh	5 ⑤ HwCw 14 <i>Hylocomium splendens</i> 15 <i>Dryopteris expansa</i> 23 <i>Tiarella unifoliata</i> 24 <i>Listera wanksiana</i>	⑥ (M)		⑥ FdCw 15 <i>Dryopteris expansa</i> 34 <i>Rubus parviflorus</i> 35 <i>Gymnocarpium dryopteris</i> 36 <i>Athyrium filix femina</i>	⑥ (G)
	moist	6			⑦ Accw 36 <i>Athyrium filix femina</i> 37 <i>Lysichiton americanum</i>	⑦ (G)
	wet	7 ⑧ Plcw 17 <i>Sphagnum</i> spp.	⑧ (L)		⑧ SsCw 36 <i>Athyrium filix femina</i> 37 <i>Lysichiton americanum</i>	⑧ (PM)

Variant 1 is the Recommended Subzone for the Hypermaritima
 Subzone (CWHd) – Grid No. 18.

General comments:

- due to the unique combination of climate, topography, parent materials, and history, the ecosystems found in this subzone feature predominantly site units **Pl**, **S**, **B**, and **F** and its climax conditions of mesotaxic development.
- in the CWHd1 Variant, more or less, limited to a narrow belt of low sites along the water front, of very heavy island (approximately 3 m) wide, and restricted to 750 m elevation. **Ss** can be used as a minor species on trees. **Fd** and nutrient medium sites that are under the combined influence of ocean spray and fog.
- the application of **Fd** in the CWHd1 Variant should be based on some evidence of its presence in the local area.

Specific comments:

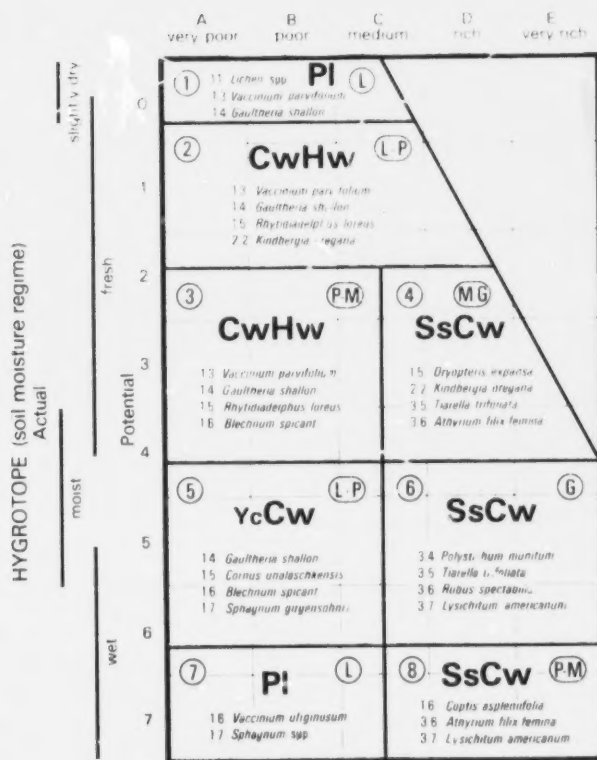
- ① marginal sites for timber production.
- ② nutrient very poor sites are marginally suitable for timber production. **Pl** is an alternative to **Hw** on nutrient very poor sites. **Ss** is an alternative to **Cw** on nutrient medium sites.
- ③ nutrient very poor sites are marginally suit due for timber production. **Pl** is an alternative to **Hw** on nutrient very poor sites. **Ss** is an alternative to **Cw** on nutrient medium sites. **Ba** is an acceptable minor species or an alternative to **Cw**.
- ④ brush hazard sites, establishment of a mixed species stand is desirable. **Yc** is an alternative to **Cw** in the upper limits of the CWHd2 Variant. **Cw** or **Yc** are preferable on steep slopes. **Hw** is an acceptable minor species. **Fd** may be used as the major crop species in the CWHd1 Variant. **Ba** is an alternative major species in the CWHd1.
- ⑤ **Pl** is an alternative to **Cw** in the CWHd2 Variant. **Hw** is an acceptable minor species.
- ⑥ brush hazard sites, establishment of a mixed species stand is desirable. **Yc** is an alternative in the upper limits of the CWHd2 Variant. **Cw** or **Yc** are preferable on steep slopes. **Hw** is an acceptable minor crop species. **Ba** is an alternative major species in the CWHd1.
- ⑦ marginal sites for timber production.
- ⑧ brush hazard sites. **Hw** is an acceptable minor species, depending on the frequency of acid organic mounds on the site.

Grid No. 18

Recommended tree species for the

CWHd	HYPERMARITIME CWH SUBZONE
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TROPHOTOPE (soil nutrient regime)



4. SLASHBURNING GUIDELINES

The slashburning recommendations in this guide represent a departure from the previous guide. Rather than suggesting prescribed burning treatments for sub divisions of the edatopic grid, we present a framework for making slashburning decisions. Figure 8 shows a flowchart outlining the decision-making process.

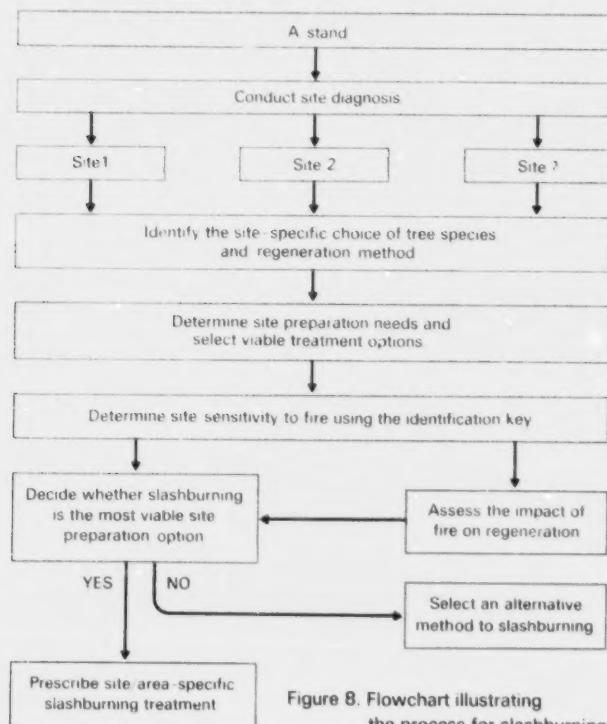


Figure 8. Flowchart illustrating the process for slashburning decision-making.

The main features of the slashburning decision-making are:

- (a) the decision should be made on a site-specific basis;
- (b) the decision should consider management factors - only the site preparation needs and treatment options which best meet management requirements should be assessed;
- (c) the decision should consider the effect of fire on regeneration of the selected tree species, and long term impact of fire on site productivity. To aid in the latter assessment, a classification of site sensitivity to fire is proposed (based on environmental properties used in site diagnosis). Identification of the five classes is made with the help of a key (Appendix VII). A brief description of the potential impact of fire and other comments for each class are given in Table 9.

Table 9. Potential impact of fire and additional comments for site sensitivity classes.

Very High Sensitivity Class

Potential impact of fire:

Fire is likely to result in severe soil degradation and reduce regeneration potential.

Fire will consume much of the forest floor on very high sensitivity sites. The forest floor accounts for the bulk of the soil water holding capacity and nutrient reserve. Destruction of the soil organic layer exposes the underlying mineral soil to erosion or the underlying bedrock or coarse fragments. After fire, regeneration would proceed very slowly.

Comments:

The decision whether or not to burn a setting comprised of a significant proportion of very high sensitivity sites should be done in consultation with the District Manager.

High Sensitivity Class

Potential impact of fire:

Removal of protective vegetative cover and forest floor by an hot low intensity fire is likely to have a high impact on the soil.

Lesser vegetative cover and/or the forest floor are important to maintain site productivity. Fire is likely to result in highly undesirable rates of surface soil erosion, decrease of the moisture holding capacity in the surface soil, and/or decrease of the soil nutrient content; therefore, organic materials should be preserved on high sensitivity sites.

Comments:

To burn a setting comprised of a significant proportion of high sensitivity sites, a stringently controlled, low intensity surface burn should be carried out.

Medium Sensitivity Class

Potential impact of fire:

Fire has a potentially moderate impact on the soil. Preservation of the bulk of the forest floor is important to maintain long term site productivity.

The rationale for the above definition is similar to that given for the high sensitivity sites. While the potential impact of fire on very sensitive sites is high, the impact on medium sensitivity sites is potentially moderate, due to a combination of properties, providing for a more fire resilient site.

Table 9 Potential impact of fire and additional comments for site sensitivity classes (cont'd)

Medium Sensitivity Class (cont'd)

Comments:

To burn a setting comprised predominantly of medium sensitivity sites, a controlled burn should be carried out so as to preserve the bulk of the forest floor.

Low Sensitivity Class

Potential impact of fire:

Fire, unless of high intensity, has a potentially low impact on the soil.

Under the prevailing climatic conditions fire removes only a small fraction of the forest floor. This loss in relation to the total depth of forest floor and/or the quantity of organic matter in the mineral soil is considered to have a low impact on site productivity.

Comments:

Burning is an effective treatment to reduce slash, retard growth of existing encroaching shrubs, or suppress development of other competing vegetation, and to initiate more rapid decomposition of acid Mor humus forms. However, in the case of old growth (climax) stands, such as those on West or North Vancouver Island, burning alone may not restore the growth potential.

Very Low Sensitivity Class

Potential impact of fire:

Fire, even of high intensity, has an insignificant impact on the soil.

The bulk of soil water holding capacity and nutrient reserve is contained in the mineral soil. Decomposition and humification of surface organic materials take place rapidly due to the active populations of soil fauna and flora. Organic matter is incorporated into the upper mineral soil layer. Destruction of the thin forest floor is not likely to affect the production potential of very low sensitivity sites, in contrast it facilitates forest regeneration.

Comments:

Burning is an effective treatment to reduce slash and to temporarily suppress shrub competition providing it precedes development of the shrub layer.

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APPENDIX Ia

Alphabetical list of edatopic indicator plant species - Latin Names

Latin Name	Common Name	Life form ¹	ETSG no	Page no for ID
* Acer circinatum	vine maple	dcsh	3.5	
* Acer glabrum	Douglas maple	dcsh	3.4	
* Acer macrophyllum	bigleaf maple	brtr	3.5	
Achillea lanulosa	western yarrow	herb	3.2	
* Achlys triphylla	vanilla leaf	herb	3.4	94
* Actaea rubra	baneberry	herb	3.6	
* Adenocaulon bicolor	pathfinder	herb	3.3	
* Adiantum pedatum	maidenhair fern	fern	3.6	114
* Agropyron spicatum	bluebunch wheatgrass	gram	3.1	
Aira caryophyllaea	silver hairgrass	gram	2.1	
Aira praecox	early hairgrass	gram	2.1	
Allium acuminatum	Hooker's onion	herb	3.2	
Allium cernuum	nodding onion	herb	3.2	
* Alliostropa virgata	candystick	pasa	1.2	
* Alnus rubra	red alder	brtr	3.6	
* Amelanchier alnifolia	Saskatoon	dcsh	2.2	74
Andromeda polifolia	bog rosemary	herb	1.7	
Angelica genutiexa	kneeling angelica	herb	3.7	
* Apocynum androsaemifolium	spreading dogbane	herb	2.1	
* Aquilegia formosa	red columbine	herb	3.5	
* Aralia nudicaulis	wild sarsaparilla	herb	3.4	
* Arbutus menziesii	arbutus	brtr	1.2	
* Arctostaphylos columbiana	hairy manzanita	evsh	2.1	
* Arctostaphylos uva ursi	kinnikinnick	evsh	2.1	75
* Arnica cordifolia	heart leaved arnica	herb	2.2	
* Arnica latifolia	mountain arnica	herb	2.4	
* Aruncus dioicus	goat's beard	herb	3.5	
* Asarum caudatum	wild ginger	herb	3.5	
* Asplenium trichomanes	maidenhair spleenwort	fern	2.2	
* Aster ciliolatus	fringed aster	herb	3.3	
* Aster conspicuus	showy aster	herb	3.3	
* Athyrium filix femina	lady fern	fern	3.6	115
Atrichum selwynii	moss		3.5	
Barbilophozia floerkei		lvrt	1.3	
Barbilophozia lycopodioides	common leafy liverwort	lvrt	1.3	
Bartramia pomiformis	apple moss	moss	2.2	
Bazzania tricenata		lvrt	1.6	
* Blechnum spicant	deer fern	fern	1.6	116
* Boschniakia hookeri	groundcone	pasa	1.2	
Boykinia elata	coast boykinia	herb	3.6	
Brachythecium albicans	lawn moss	moss	1.3	
Bromus carinatus	California brome	gram	3.2	
Bromus vulgaris	Columbia brome	gram	3.5	
Calamagrostis canadensis	bluejoint	gram	3.6	
Calamagrostis nutkaensis	Pacific reedgrass	gram	3.5	
* Calamagrostis rubescens	pinegrass	gram	3.3	
* Caltha biflora	two-flowered white marsh-marigold	herb	3.7	

¹ Explanation of life form codes on page 71

² Species with asterisks are a desirable standard for operational use

APPENDIX Ia (cont'd 2)

Latin Name	Common Name	Life Form	ESG No.	Page No.
* <i>Caltha leptosepala</i>	alpine white marsh marigold	herb	3	7
* <i>Calypogeja trichomanis</i>		lvrt	1	5
* <i>Calypso bulbosa</i>	fairy slipper	herb	2	3
* <i>Camassia leichtlinii</i>	great camas	herb	3	2
* <i>Camassia quamash</i>	common camas	herb	3	2
* <i>Campanula scouleri</i>	Scouler's harebell	herb	3	1
* <i>Cardamine breweri</i>	Brewer's bitter cress	herb	3	7
* <i>Cardamine nuttallii</i>	Nuttall's bitter cress	herb	3	6
* <i>Carex aquatilis</i>	water sedge	gram	3	7
* <i>Carex deweyana</i>	Dewey's sedge	gram	3	6
* <i>Carex hendersonii</i>	Henderson's sedge	gram	3	6
* <i>Carex laeviculmis</i>	smooth stemmed sedge	gram	3	7
* <i>Carex livida</i>	pale sedge	gram	3	7
* <i>Carex obnupta</i>	slough sedge	gram	3	7
* <i>Carex pensylvanica</i>	long stoloned sedge	gram	3	1
* <i>Carex rossi</i>	Ross' sedge	gram	3	2
* <i>Cassiope mertensiana</i>	white mountain heather	evsh	1	4
* <i>Cassiope stelleriana</i>	Alaskan mountain heather	evsh	1	5
* <i>Cassiope tetragona</i>	four angled mountain heather	evsh	2	4
* <i>Ceanothus sanguineus</i>	redstem ceanothus	dcsh	3	2
* <i>Ceanothus velutinus</i>	snowbush ceanothus	evsh	3	2
* <i>Chimaphila menziesii</i>	Menzies' pipsissewa	evsh	1	4 95
* <i>Chimaphila umbellata</i>	prince's pine	evsh	1	2 96
* <i>Cinna latifolia</i>	nodding wood reed	gram	3	6
* <i>Circaea alpina</i>	alpine enchanter's nightshade	herb	2	4
* <i>Circaea pacifica</i>	Pacific enchanter's nightshade	herb	3	5
* <i>Cladina³ arbuscula</i>		lchn	1	1 121
* <i>Cladina³ impexa</i>		lchn	1	1 121
* <i>Cladina³ mitis</i>		lchn	1	1 121
* <i>Cladina³ rangiferina</i>		lchn	1	1 121
* <i>Cladina³ stellaris</i>		lchn	1	1 121
* <i>Cladonia bellidiflora</i>	red top lichen	lchn	1	2 121
* <i>Cladonia³ gracilis</i>		lchn	1	1 121
* <i>Cladothamnus pyroliflorus</i>	copperbush	dcsh	1	5
* <i>Claytonia sibirica</i>	Siberian miner's lettuce	herb	3	5
* <i>Clintonia uniflora</i>	queen's cup	herb	1	4 97
* <i>Collinsia parviflora</i>	small flowered blue eyed Mary	herb	3	4
* <i>Conocephalum conicum</i>		lvrt	3	6
* <i>Coptis asplenifolia</i>	fern-leaved goldthread	herb	1	6 98
* <i>Coptis trifolia</i>	three-leaved goldthread	herb	1	6
* <i>Corallorhiza mertensiana</i>	western coralroot	pasa	1	4
* <i>Cornus canadensis</i>	bunchberry	herb	1	4
* <i>Cornus nuttallii</i>	flowering dogwood	brtr	3	3
* <i>Cornus sericea</i>	red-osier dogwood	dcsh	3	6 76
* <i>Cornus unalaschensis</i>	Cordilleran bunchberry	herb	1	5
* <i>Corylus cornuta</i>	hazelnut	dcsh	3	3
* <i>Crataegus douglasii</i>	black hawthorn	dcsh	3	6

³ May all be referred to as lichen spp.

APPENDIX 1a (cont'd 3)

Latin Name	Common Name	Life form	EISG no.	Page no. for ID
<i>Cryptogramma crispa</i>	parsley fern	fern	2 1	
<i>Cystopteris fragilis</i>	fragile fern	fern	3 4	
* <i>Cytisus scoparius</i>	broom	dcsh	1 2	
<i>Danthonia californica</i>	California oatgrass	gram	2 1	
<i>Danthonia spicata</i>	poverty oatgrass	gram	2 1	
* <i>Dicentra formosa</i>	bleeding heart	herb	3 5	
<i>Dicranum fuscescens</i>		moss	1 2	
<i>Dicranum howellii</i>		moss	1 3	
<i>Dicranum pallidisetum</i>		moss	1 3	
<i>Dicranum tauricum</i>	broken leaf moss	moss	1 2	
<i>Diplophyllum albicans</i>		lvrt	3 6	
* <i>Disporum hookeri</i>	Hooker's fairybells	herb	3 4	99
<i>Disporum smithii</i>	Smith's fairybells	herb	3 5	
* <i>Disporum trachycarpum</i>	rough fruited fairybells	herb	3 4	100
<i>Dodecatheon hendersonii</i>	broad leaved shootingstar	herb	3 4	
<i>Dodecatheon pulchellum</i>	few-flowered shootingstar	herb	3 4	
* <i>Orosera rotundifolia</i>	round-leaved sundew	herb	1 7	
* <i>Dryopteris expansa</i>	spiny wood fern	fern	1 5	117
<i>Elymus glaucus</i>	blue wildrye	gram	3 3	
* <i>Empetrum nigrum</i>	crowberry	evsh	1 4	
<i>Equisetum hyemale</i>	scouring-rush	fern	3 5	
* <i>Equisetum pratense</i>	meadow horsetail	fern	3 6	
<i>Equisetum sylvaticum</i>	wood horsetail	fern	3 7	
* <i>Equisetum telmateia</i>	giant horsetail	fern	3 7	
<i>Erigeron peregrinus</i>	subalpine daisy	herb	3 6	
<i>Enophorum angustifolium</i>	narrow-leaved cotton grass	gram	1 7	
<i>Eriophyllum lanatum</i>	woolly sunflower	herb	3 1	
<i>Erythronium oregonum</i>	white fawn lily	herb	3 2	
<i>Erythronium revolutum</i>	pink fawn lily	herb	3 5	
<i>Fauna crista galli</i>	deer cabbage	herb	1 7	
* <i>Festuca occidentalis</i>	western fescue	gram	1 3	
<i>Festuca subulata</i>	bearded fescue	gram	3 5	
<i>Festuca subuliflora</i>	crinkle-awned fescue	gram	3 5	
<i>Fontinalis antipyretica</i>		moss	1 7	
<i>Fritillaria lanceolata</i>	chocolate lily	herb	3 4	
<i>Galium aparine</i>	cleavers	herb	3 4	
* <i>Galium triflorum</i>	sweet-scented bedstraw	herb	3 5	
<i>Gaultheria hispidula</i>	creeping-snowberry	evsh	1 5	
<i>Gaultheria humifusa</i>	alpine-wintergreen	evsh	1 5	
* <i>Gaultheria ovatifolia</i>	western tea-berry	evsh	1 2	77
* <i>Gaultheria shallon</i>	salal	evsh	1 4	78
<i>Gentiana douglasiana</i>	swamp gentian	herb	1 7	
<i>Gentiana sceptrum</i>	king gentian	herb	1 7	
<i>Geocalium lividum</i>	bastard toad-flax	herb	1 5	
* <i>Geum macrophyllum</i>	large-leaved avens	herb	3 5	
* <i>Goodyera oblongifolia</i>	rattlesnake-plantain	herb	1 3	101
* <i>Gymnocarpium dryopteris</i>	oak fern	fern	3 5	118

APPENDIX Ia (cont'd 4)

Latin Name	Common Name	Life form	EISG no.	Page no. for ID
Hemitomes congestum	gnome plant	pasa	2.4	
* Heracleum lanatum	cow parsnip	herb	3.5	
* Hieracium albiflorum	white flowered hawkweed	herb	1.3	
Holcus lanatus	Yorkshire fog	gram	2.3	
* Holodiscus discolor	ocean spray	dcsh	2.1	79
* Homalothecium megaptium		moss	1.2	
Hookeria lucens		moss	3.6	
* Hylocomium splendens	step moss	moss	1.4	122
Hypericum formosum	western St. John's wort	herb	2.3	
* Hypochaeris radicata	hairy cat's ear	herb	1.3	
Hypopithys lanuginosa	pinemap	pasa	1.3	
Isopterygium elegans		moss	1.5	
Juncus effusus	common rush	gram	3.7	
Juncus ensifolius	dagger leaved rush	gram	3.7	
* Juniperus scopulorum	Rocky Mountain juniper	evsh	3.1	80
Juniperus sibirica	common juniper	evsh	3.2	
* Kalmia microphylla	bog laurel	evsh	1.7	
* Kindbergia oregana		moss	2.2	123
* Kindbergia praelonga		moss	3.6	
Lathyrus nevadensis	purple peavine	herb	3.3	
Lathyrus ochroleucus	creamy peavine	herb	3.4	
* Ledum groenlandicum	Labrador tea	evsh	1.7	
Lepidozia reptans		lvrt	1.5	
* Leucolepis menziesii		moss	3.6	124
* Lilium columbianum	tiger lily	herb	2.2	
* Linnaea borealis	twinflower	evsh	1.4	
* Listera banksiana	northwestern twayblade	herb	2.4	
Listera convallarioides	broad-leaved twayblade	herb	3.7	
* Listera cordata	heart-leaved twayblade	herb	1.4	
* Lonicera ciliosa	orange honeysuckle	dcsh	3.2	
* Lonicera hispidula	purple honeysuckle	dcsh	3.2	
* Lonicera involucrata	black twinberry	dcsh	3.5	
* Lonicera utahensis	red twinberry	dcsh	2.3	
* Luetkea pectinata	partridge foot	herb	2.4	
* Lupinus arcticus	arctic lupine	herb	3.3	
Lupinus nootkatensis	Nootka lupine	herb	3.4	
Luzula multiflora	many-flowered woodrush	gram	2.1	
* Luzula parviflora	small-flowered woodrush	gram	2.4	
* Lycopodium annotinum	stiff club-moss	fern	1.3	
* Lycopodium clavatum	running club-moss	fern	1.3	
Lycopodium complanatum	ground-cedar	fern	1.3	
* Lysichitum americanum	skunk cabbage	herb	3.7	102
Madia madioides	woodland tarweed	herb	3.2	
* Mahonia aquifolium	tall Oregon-grape	evsh	3.2	81
* Mahonia nervosa	dull Oregon-grape	evsh	2.2	82
* Maianthemum dilatatum	false lily-of-the-valley	herb	3.6	
* Malus fusca	Pacific crab apple	brtr	3.7	
Marchantia polymorpha		lvrt	3.6	

APPENDIX Ia (cont'd 5)

Latin Name	Common Name	Life form	EISG no.	Page no. for I.D.
<i>Melica subulata</i>	Alaska onion grass	gram	3.4	
* <i>Menziesia ferruginea</i>	false azalea	dcsh	1.5	83
* <i>Mitella breweri</i>	Brewer's mitrewort	herb	3.6	
* <i>Mitella nuda</i>		herb	3.6	
* <i>Mitella ovalis</i>	oval-leaved mitrewort	herb	3.6	
* <i>Mitella pentandra</i>	five-stamened mitrewort	herb	3.6	
* <i>Mnium spinulosum</i>		moss	2.3	
* <i>Moehringia macrophylla</i>	big-leaved sandwort	herb	3.3	
* <i>Moneses uniflora</i>	single delight	herb	2.4	
* <i>Monotropa uniflora</i>	Indian-pipe	para	2.4	
* <i>Montia parvifolia</i>	small-leaved montia	herb	2.3	
* <i>Mycelis muralis</i>	milkweed	herb	3.5	
* <i>Myrica gale</i>	sweet gale	dcsh	3.7	
* <i>Oemleria cerasiformis</i>	Indian plum	dcsh	3.5	
* <i>Oenanthe sarmentosa</i>	Pacific oenanthe	herb	3.7	
* <i>Oplopanax horridus</i>	devil's club	dcsh	3.6	84
* <i>Orthilia secunda</i>	one-sided wintergreen	herb	1.3	103
* <i>Osmorhiza chilensis</i>	mountain sweet cicely	herb	3.5	
<i>Parnassia fimbriata</i>	fringed grass-of-Parnassus	herb	3.6	
* <i>Paxistima myrsinites</i>	falsebox	evsh	1.3	85
* <i>Pedicularis bracteosa</i>	bracted lousewort	herb	2.4	
* <i>Pedicularis racemosa</i>	sickletop lousewort	herb	2.2	
<i>Pellia neesiana</i>		lvrt	3.7	
* <i>Peltigera aphthosa</i>		lchn	1.2	
* <i>Peltigera membranacea</i>		lchn	1.3	
<i>Peridendia gairdneri</i>	yampah	herb	3.3	
* <i>Petasites frigidus</i>	sweet colt's-foot	herb	3.6	
* <i>Petasites palmatus</i>	palmate colt's-foot	herb	3.6	
* <i>Philadelphus lewisii</i>	mock-orange	dcsh	3.4	
<i>Philonotis fontana</i>		moss	3.7	
* <i>Phyllodoce empetrifolia</i>	pink mountain-heather	evsh	1.4	
* <i>Phyllodoce glanduliflora</i>	yellow mountain-heather	evsh	3.3	
* <i>Physocarpus capitatus</i>	Pacific ninebark	dcsh	3.6	
<i>Plagiocilia porelloides</i>		lvrt	2.4	
* <i>Plagiomnium insignis</i>		moss	3.8	125
* <i>Plagiothecium undulatum</i>		moss	1.5	126
* <i>Platanthera dilatata</i>	white bog-orchid	herb	3.7	
* <i>Platanthera orbiculata</i>	round-leaved rein-orchid	herb	1.3	
* <i>Pleurozium schreberi</i>	red-stemmed feather moss	moss	1.3	127
* <i>Pogonatum contortum</i>		moss	2.4	
<i>Pogonatum sylvaticum</i>		moss	2.4	
* <i>Polypodium glycyrrhiza</i>	licorice fern	fern	3.3	
<i>Polypodium scolieri</i>	leatherleaf polypody	fern	3.5	
<i>Polystichum braunii</i>	Braun's holly-fern	fern	3.5	
* <i>Polystichum lonchitis</i>	mountain holly-fern	fern	3.3	
* <i>Polystichum munitum</i>	sword fern	fern	3.4	119
* <i>Polytrichum juniperinum</i>		moss	1.3	
<i>Polytrichum piliferum</i>		moss	2.1	
* <i>Populus tremuloides</i>	trembling aspen	brtr	3.3	
* <i>Populus trichocarpa</i>	black cottonwood	brtr	3.5	
<i>Potentilla glandulosa</i>	sticky cinquefoil	herb	3.4	

APPENDIX 1a (cont'd 6)

Latin Name	Common Name	Life Form	ESG	Page no. for ID
<i>Prenanthes alata</i>	western rattlesnake root	herb	3.5	
* <i>Prunus virginiana</i>	choke cherry	dcsh	3.4	
* <i>Pteridium aquilinum</i>	bracken	fern	3.3	120
* <i>Pterospora andromedea</i>	pinelrops	para	2.1	
* <i>Ptilium crista-castrensis</i>	knight's plume moss	moss	1.4	128
* <i>Pyrola asarifolia</i>	pink wintergreen	herb	2.3	104
* <i>Pyrola chlorantha</i>	green wintergreen	herb	2.3	
<i>Pyrola dentata</i>	Nootka wintergreen	herb	2.1	
* <i>Pyrola picta</i>	white veined wintergreen	herb	2.3	
* <i>Quercus garryana</i>	Garry oak	trfr	3.2	
<i>Ranunculus eschscholzi</i>	subalpine buttercup	herb	3.6	
* <i>Ranunculus occidentalis</i>	western buttercup	herb	3.4	
<i>Ranunculus repens</i>	creeping buttercup	herb	3.7	
<i>Ranunculus uncinatus</i>	little buttercup	herb	3.6	
* <i>Rhacomitrium canescens</i>		moss	1.1	
<i>Rhacomitrium heterostichum</i>		moss	1.1	
* <i>Rhamnus purshianus</i>	cascara	dcsh	3.6	
* <i>Rhizomnium glabrescens</i>		moss	2.4	129
<i>Rhizomnium magnifolium</i>		moss	3.7	
<i>Rhizomnium nudum</i>		moss	3.6	
* <i>Rhododendron albiflorum</i>	white flowered rhododendron	dcsh	1.4	86
<i>Rhynchospora alba</i>	beak rush	gram	1.7	
* <i>Rhytidadelphus loreus</i>		moss	1.5	120
<i>Rhytidadelphus squarrosus</i>		moss	3.6	
* <i>Rhytidadelphus triquetrus</i>	electrified cat's tail moss	moss	3.3	131
* <i>Rhytidopsis robusta</i>	pipecleaner moss	moss	1.4	132
* <i>Ribes bracteosum</i>	stink currant	dcsh	3.6	
<i>Ribes divaricatum</i>	wild gooseberry	dcsh	3.4	
* <i>Ribes lacustre</i>	black gooseberry	dcsh	3.5	
* <i>Ribes lobbia</i>	gummy gooseberry	dcsh	3.2	
* <i>Ribes sanguineum</i>	red-flowering currant	dcsh	3.3	
* <i>Rosa acicularis</i>	prickly rose	dcsh	3.4	
* <i>Rosa gymnocarpa</i>	balldip rose	dcsh	1.3	
* <i>Rubus idaeus</i>	red raspberry	dcsh	3.4	
* <i>Rubus leucodermis</i>	black raspberry	dcsh	3.4	
* <i>Rubus parviflorus</i>	thimbleberry	dcsh	3.4	
* <i>Rubus pedatus</i>	five-leaved bramble	evsh	1.5	105
<i>Rubus pubescens</i>	trailing raspberry	evsh	3.5	
* <i>Rubus spectabilis</i>	salmonberry	dcsh	3.6	87
* <i>Rubus ursinus</i>	trailing blackberry	dcsh	2.2	
<i>Salix hookeriana</i>	Hooker's willow	dcsh	3.6	
<i>Salix scouleriana</i>	Scouler's willow	dcsh	2.3	
* <i>Sambucus racemosa</i>	elderberry	dcsh	3.4	
* <i>Sanguisorba canadensis</i>	Silka burnet	herb	1.6	
* <i>Sanguisorba officinalis</i>	great burnet	herb	1.6	
<i>Sanicula crassicaulis</i>	western snake-root	herb	3.3	
<i>Sanicula graveolens</i>	Sierra sanicle	herb	3.2	
<i>Satureja douglasii</i>	yerba buena	evsh	3.2	
* <i>Scirpus microcarpus</i>	small-flowered bulrush	gram	3.7	

APPENDIX Ia (cont'd 7)

Latin Name	Common Name	Life form	EISG no.	Page no. for I.D.
* Sedum spathulifolium	broad-leaved stonecrop	herb	31	
* Selaginella wallacei	Wallace's selaginella	fern	31	
Senecio sylvaticus	wood groundsel	herb	34	
Senecio vulgaris	common groundsel	herb	34	
* Shepherdia canadensis	scopolallie	dcsh	33	
Siphula ceratites		lchn	16	
Sisyrinchium douglasii	satin flower	herb	33	
* Smilacina racemosa	false Solomon's seal	herb	34	106
* Smilacina stellata	star-flowered false Solomon's seal	herb	34	107
* Sorbus scopulina	western mountain ash	dcsh	13	
* Sorbus sitchensis	Sitka mountain ash	dcsh	13	
Sphagnum ⁴ fallax		moss	17	133
Sphagnum ⁴ fuscum		moss	17	133
Sphagnum ⁴ girgensohnii		moss	17	133
Sphagnum palustre		moss	37	133
Sphagnum ⁴ papillosum		moss	17	133
Sphagnum ⁴ tenellum		moss	17	
* Spiraea betulifolia	birch-leaved spirea	dcsh	33	88
Spiraea densiflora	subalpine spirea	dcsh	23	
* Spiraea douglasii	hardhack	dcsh	16	89
Spiraea menziesii	pink spirea	dcsh	36	
* Stachys cooleyae	Cooley's hedge-nettle	herb	36	
Stachys mexicana	Mexican hedge-nettle	herb	36	
Stellaria crispa	crisp starwort	herb	36	
Stenanthium occidentale	mountainbells	herb	16	
Stereocaulon tomentosum		lchn	11	
* Streptopus amplexifolius	clasping twistedstalk	herb	35	108
* Streptopus roseus	rosy twistedstalk	herb	35	109
* Streptopus streptopoides	small twistedstalk	herb	15	
* Symphoricarpos albus	common snowberry	dcsh	34	
* Symphoricarpos hesperius	trailing snowberry	dcsh	32	
* Taxus brevifolia	western yew	cntr	34	
* Telima grandiflora	tall fringe-cup	herb	35	
* Thalictrum occidentale	western meadowrue	herb	35	
* Tiarella laciniata	cut-leaved foamflower	herb	35	110
* Tiarella trifoliata	three-leaved foamflower	herb	35	111
* Tiarella unifoliata	one-leaved foamflower	herb	23	112
Timmia austriaca		moss	33	
Tofieldia glutinosa	sticky false asphodel	herb	37	
* Tolmiea menziesii	piggy-back plant	herb	35	
Torreyochloa pauciflora	false manna	gram	37	
* Trautvetteria carolinensis	false bugbane	herb	36	
Trichophorum caespitosum	tufted deer-grass	gram	17	
Trientalis arctica	northern starflower	herb	17	
* Trientalis latifolia	broad-leaved starflower	herb	33	
* Trillium ovatum	trillium	herb	35	
Trisetum cernuum	nodding trisetum	gram	35	
Urtica dioica	stinging nettle	herb	35	

⁴ May all be referred to as Sphagnum spp.

APPENDIX Ia (cont'd 8)

Latin Name	Common Name	Life form	EISG no	Page no for ID
*Vaccinium alaskaense	Alaskan blueberry	dcsh	15	90
*Vaccinium caespitosum	dwarf blueberry	dcsh	15	
*Vaccinium deliciosum	Cascade blueberry	dcsh	15	
*Vaccinium membranaceum	black huckleberry	dcsh	13	91
*Vaccinium ovalifolium	oval leaved blueberry	dcsh	23	92
*Vaccinium ovatum	evergreen huckleberry	evsh	13	
Vaccinium oxycoccos	bog cranberry	evsh	17	
*Vaccinium parvifolium	red huckleberry	dcsh	13	93
*Vaccinium scoparium	grouseberry	dcsh	21	
*Vaccinium uliginosum	bog blueberry	dcsh	16	
Vahlodea atropurpurea	mountain hairgrass	gram	16	
Valeriana scouleri	Scouler's Sitka valerian	herb	36	
*Valeriana sitchensis	Sitka valerian	herb	36	
*Veratrum viride	Indian hellabore	herb	36	113
*Veronica americana	American brooklime	herb	37	
*Viburnum edule	highbush cranberry	dcsh	36	
Viburnum trilobum	American bush cranberry	dcsh	36	
Vicia americana	American vetch	herb	23	
*Viola adunca	early blue violet	herb	22	
*Viola glabella	stream violet	herb	36	
*Viola orbiculata	round leaved violet	herb	13	
*Viola sempervirens	trailing yellow violet	herb	22	
Zygadenus venenosus	death camas	herb	32	

APPENDIX 1b Alphabetical list of edatopic indicator plant species - common names

Common Name	Latin Name	Life form	EISG no	Page no for ID
* alder, red	<i>Alnus rubra</i>	brtr	3.6	
angelica, kneeling	<i>Angelica genuflexa</i>	herb	3.7	
* apple, Pacific crab	<i>Malus fusca</i>	brtr	3.7	
* arbutus	<i>Arbutus menziesii</i>	brtr	1.2	
* arnica, heart leaved	<i>Arnica cordifolia</i>	herb	2.2	
* arnica, mountain	<i>Arnica latifolia</i>	herb	2.4	
* aspen, trembling	<i>Populus tremuloides</i>	brtr	3.2	
asphodel, sticky false	<i>Tofieldia glutinosa</i>	herb	3.7	
aster, fringed	<i>Aster ciliolatus</i>	herb	3.3	
* aster, showy	<i>Aster conspicuus</i>	herb	3.3	
* avens, large leaved	<i>Geum macrophyllum</i>	herb	3.3	
* azalea, false	<i>Menziesia ferruginea</i>	dcsh	1.5	83
* haneberry	<i>Actaea rubra</i>	herb	3.6	
beak, rush	<i>Rhynchospora alba</i>	gram	1.7	
* bedstraw, sweet-scented	<i>Galium triflorum</i>	herb	3.5	
bitter cress, Brewer's	<i>Cardamine breweri</i>	herb	3.7	
bitter cress, Nuttall's	<i>Cardamine nuttallii</i>	herb	3.6	
* blackberry, trailing	<i>Rubus ursinus</i>	dcsh	2.2	
* bleeding heart	<i>Dicentra formosa</i>	herb	3.5	
* blueberry, Alaskan	<i>Vaccinium alaskaense</i>	dcsh	1.5	90
* blueberry, bog	<i>Vaccinium uliginosum</i>	dcsh	1.6	
* blueberry, Cascade	<i>Vaccinium deliciosum</i>	dcsh	1.5	
* blueberry, dwarf	<i>Vaccinium caespitosum</i>	dcsh	1.5	
* blueberry, oval leaved	<i>Vaccinium ovalifolium</i>	dcsh	2.3	92
blue-eyed Mary, small flowered	<i>Collinsia parviflora</i>	herb	3.4	
bluejoint	<i>Calamagrostis canadensis</i>	gram	3.6	
* bog laurel	<i>Kalmia microphylla</i>	evsh	1.7	
* bog orchid, white	<i>Platanthera dilatata</i>	herb	3.7	
boykinia, coast	<i>Boykinia elata</i>	herb	3.6	
* bracken	<i>Pteridium aquilinum</i>	fern	3.3	120
* bramble, five leaved	<i>Rubus pedatus</i>	evsh	1.5	105
brome, California	<i>Bromus carinatus</i>	gram	3.2	
brome, Columbia	<i>Bromus vulgaris</i>	gram	3.5	
* brooklime, American	<i>Veronica americana</i>	herb	3.7	
* broom	<i>Cytisus scoparius</i>	dcsh	1.2	
* bugbane, false	<i>Traditvetteria carolinensis</i>	herb	3.6	
* bulrush, small-flowered	<i>Scirpus microcarpus</i>	gram	3.7	
* bunchberry	<i>Cornus canadensis</i>	herb	1.4	
* bunchberry, Cordilleran	<i>Cornus unalaschensis</i>	herb	1.5	
* burnet, great	<i>Sanguisorba officinalis</i>	herb	1.6	
* burnet, Sitka	<i>Sanguisorba canadensis</i>	herb	1.6	
buttercup, creeping	<i>Ranunculus repens</i>	herb	3.7	
buttercup, little	<i>Ranunculus uncinatus</i>	herb	3.6	
buttercup, subalpine	<i>Ranunculus eschscholzi</i>	herb	3.6	
* buttercup, western	<i>Ranunculus occidentalis</i>	herb	3.4	
* camas, common	<i>Camassia quamash</i>	herb	3.2	
* camas, great	<i>Camassia leichtlinii</i>	herb	3.2	

¹ Explanation of life form codes is given on page 71.

* Species with asterisks are a desirable standard for operational use.

APPENDIX 1b (cont'd 2)

Common Name	Latin Name	Life-form	EISG no.	Page no. for ID
* candystick	Allotropa virgata	pasa	1 2	
* cascara	Rhamnus purshianus	dcsh	3 6	
* cat's ear, hairy	Hypochoeris radicata	herb	1 3	
* ceanothus, redstem	Ceanothus sanguineus	dcsh	3 2	
ceanothus, snowbush	Ceanothus velutinus	evsh	3 2	
* cherry, choke	Prunus virginiana	dcsh	3 4	
* cinquefoil, sticky	Potentilla glandulosa	herb	3 4	
cleavers	Galium aparine	herb	3 4	
* club moss, running	Lycopodium clavatum	fern	1 3	
* club moss, stiff	Lycopodium annotinum	fern	1 3	
* colt's foot, palmate	Petasites palmatus	herb	3 6	
colt's foot, sweet	Petasites frigidus	herb	3 6	
* columbine, red	Aquilegia formosa	herb	3 5	
* copperbush	Cladanthus pyroliflorus	dcsh	1 5	
* coralroot, western	Corallorhiza mertensiana	pasa	1 4	
cotton grass, narrow leaved	Eriophorum angustifolium	gram	1 7	
* cottonwood, black	Populus trichocarpa	brtr	3 5	
* cow parsnip	Heracleum lanatum	herb	3 5	
cranberry, American bush	Viburnum trilobum	dcsh	3 6	
cranberry, bog	Vaccinium oxycoccos	evsh	1 7	
* cranberry, highbush	Viburnum edule	dcsh	3 6	
* crowberry	Empetrum nigrum	evsh	1 4	
* currant, red-flowering	Ribes sanguineum	dcsh	3 3	
* currant, stink	Ribes bracteosum	dcsh	3 6	
daisy, subalpine	Erigeron peregrinus	herb	3 6	
death-camas	Zygadenus venenosus	herb	3 2	
deer cabbage	Fauxia cristata	herb	1 7	
deer-grass, tufted	Trichophorum caespitosum	gram	1 7	
* devil's club	Oplopanax horridus	dcsh	3 6	84
* dogbane, spreading	Apocynum androsaemifolium	herb	2 1	
* dogwood, flowering	Cornus nuttallii	brtr	3 3	
* dogwood, red-osier	Cornus sericea	dcsh	3 6	76
* elderberry, red	Sambucus racemosa	dcsh	3 4	
* enchanter's nightshade, alpine	Circaea alpina	herb	2 4	
enchanter's nightshade, Pacific	Circaea pacifica	herb	3 5	
* fairybells, Hooker's	Disporum hookeri	herb	3 4	99
* fairybells, rough-fruited	Disporum trachycarpum	herb	3 4	100
fairybells, Smith's	Disporum smithii	herb	3 5	
* fairy-slipper	Calypso bulbosa	herb	2 3	
* falsebox	Paxistima myrsinites	evsh	1 3	85
fern, Braun's holly	Polystichum braunii	fern	3 5	
* fern, deer	Blechnum spicant	fern	1 6	116
fern, fragile	Cystopteris fragilis	fern	3 4	
* fern, lady	Athyrium filix-femina	fern	3 6	115
* fern, licorice	Polypodium glycyrrhiza	fern	3 3	
* fern, maidenhair	Adiantum pedatum	fern	3 6	114
* fern, mountain holly	Polystichum lonchitis	fern	3 3	

APPENDIX 1b (cont'd 3)

Common Name	Latin Name	Life-form	EISG no.	Page no for I.D.
*fern, oak	Gymnocarpium dryopteris	fern	3.5	118
fern, parsley	Cryptogramma crassa	fern	2.1	
*fern, spiny wood	Dryopteris expansa	fern	1.5	117
*fern, sword	Polystichum munitum	fern	3.4	119
*foamflower, cut-leaved	Tiarella laciniata	herb	3.5	110
*foamflower, one-leaved	Tiarella unifoliata	herb	2.3	112
*foamflower, three-leaved	Tiarella trifoliata	herb	3.5	111
*fringecup, tall	Tellima grandiflora	herb	3.5	
gentian, king	Gentiana sceptrum	herb	1.7	
gentian, swamp	Gentiana douglasiana	herb	1.7	
*ginger, wild	Asarum caudatum	herb	3.5	
gnome plant	Hemitomes congestum	pasa	2.4	
*goat's-beard	Aruncus dioicus	herb	3.5	
*goldthread, fern-leaved	Coptis asplenifolia	herb	1.6	98
*goldthread, three-leaved	Coptis trifolia	herb	1.6	
*gooseberry, black	Ribes lacustre	dcsh	3.5	
*gooseberry, gummy	Ribes lobbiai	dcsh	3.2	
gooseberry, wild	Ribes divaricatum	dcsh	3.4	
grass-of-Parnassus, fringed	Parnassia fimbriata	herb	3.6	
ground-cedar	Lycopodium complanatum	fern	1.3	
*groundcone	Boschniakia hookeri	pasa	1.2	
groundsel, common	Senecio vulgaris	herb	3.4	
groundsel, wood	Senecio sylvaticus	herb	3.4	
*grouseberry	Vaccinium scoparium	dcsh	2.1	
hairgrass, early	Aira praecox	gram	2.1	
hairgrass, mountain	Vahlodea atropurpurea	gram	1.6	
hairgrass, silver	Aira caryophyllaea	gram	2.1	
*hardhack	Spiraea douglasii	dcsh	1.6	89
harebell, Scouler's	Campanula scouleri	herb	3.1	
*hawkweed, white-flowered	Hieracium albidiflorum	herb	1.3	
hawthorn, black	Crataegus douglasii	dcsh	3.6	
hazelnut	Corylus cornuta	dcsh	3.3	
*hedge-nettle, Cooley's	Stachys cooleyae	herb	3.6	
hedge-nettle, Mexican	Stachys mexicana	herb	3.6	
*hellabore, Indian	Veratrum viride	herb	3.6	113
*honeysuckle, orange	Lonicera ciliosa	dcsh	3.2	
*honeysuckle, purple	Lonicera hispidula	dcsh	3.2	
*horsetail, giant	Equisetum telmateia	fern	3.7	
*horsetail, meadow	Equisetum pratense	fern	3.6	
horsetail, wood	Equisetum sylvaticum	fern	3.7	
*huckleberry, black	Vaccinium membranaceum	dcsh	1.3	91
*huckleberry, evergreen	Vaccinium ovatum	evsh	1.3	
*huckleberry, red	Vaccinium parvifolium	dcsh	1.3	93
*Indian-pipe	Monotropa uniflora	pasa	2.4	
*Indian-plum	Oemleria cerasiformis	dcsh	3.5	
juniper, common	Juniperus sibirica	evsh	3.2	
*juniper, Rocky Mountain	Juniperus scopulorum	evsh	3.1	80
*kinnikinnick	Arctostaphylos uva-ursi	evsh	2.1	75

APPENDIX 1b (cont'd 4)

Common Name	Latin Name	Life form	EISG no	Page no for ID
* Labrador tea	Ledum groenlandicum	evsh	1.7	
* lichen	Cladonia and Cladina spp.	lchn	1.1	121
* lichen, red-top	Cladonia bellidiflora	lchn	1.2	
* lily, chocolate	Fritillaria lanceolata	herb	3.4	
* lily, pink fawn	Erythronium revolutum	herb	3.5	
* lily, tiger	Lilium columbianum	herb	2.2	
* lily, white fawn	Erythronium oregonum	herb	3.2	
* lily-of-the-valley, false	Maianthemum dilatatum	herb	3.6	
* liverwort, common leafy	Barbilophozia lycopodioides	lvrt	1.3	
* lousewort, bracted	Pedicularis bracteosa	herb	2.4	
* lousewort, sickletop	Pedicularis racemosa	herb	2.2	
* lupine, arctic	Lupinus arcticus	herb	3.3	
* lupine, Nootka	Lupinus nootkatensis	herb	3.4	
* manna, false	Torreyochloa pauciflora	gram	3.7	
* manzanita, hairy	Arctostaphylos columbiana	evsh	2.1	
* maple, bigleaf	Acer macrophyllum	brtr	3.5	
* maple, Douglas	Acer glabrum	dcsh	3.4	
* maple, vine	Acer circinatum	dcsh	3.5	
* marsh-marigold, alpine				
* white	Caltha leptosepala	herb	3.7	
* marsh-marigold, two-flowered white	Caltha biflora	herb	3.7	
* meadowrue, western	Thalictrum occidentale	herb	3.5	
* milkweed	Mycelis muralis	herb	3.5	
* miner's lettuce, Siberian	Claytonia sibirica	herb	3.5	
* mitrewort, Brewer's	Mitella breweri	herb	3.6	
* mitrewort, five-stamened	Mitella pentandra	herb	3.6	
* mitrewort, oval-leaved	Mitella ovalis	herb	3.6	
* mock-orange	Philadelphus lewisii	dcsh	3.4	
* montia, small-leaved	Montia parvifolia	herb	2.3	
* moss, apple	Bartramia pomiformis	moss	2.2	
* moss, broken-leaf	Dicranum tauricum	moss	1.2	
* moss, electrified cat's tail	Rhytidiadelphus triquetrus	moss	3.3	131
* moss, knight's plume	Ptilium crista-castrensis	moss	1.4	128
* moss, lawn	Brachythecium albicans	moss	1.3	
* moss, pipecleaner	Rhytidiopsis robusta	moss	1.4	132
* moss, red-stemmed feather	Pleurozium schreberi	moss	1.3	127
* moss, step	Hylocomium splendens	moss	1.4	122
* mountain-ash, Sitka	Sorbus sitchensis	dcsh	1.3	
* mountain-ash, western	Sorbus scopulina	dcsh	1.3	
* mountainbells	Stenanthium occidentale	herb	1.6	
* mountain-heather, Alaskan	Cassiope stelleriana	evsh	1.5	
* mountain-heather, four-angled	Cassiope tetragona	evsh	2.4	
* mountain-heather, pink	Phyllodoce empetriflora	evsh	1.4	
* mountain-heather, white	Cassiope mertensiana	evsh	1.4	
* mountain-heather, yellow	Phyllodoce glanduliflora	evsh	3.3	
* nettle, stinging	Urtica dioica	herb	3.5	
* ninebark, Pacific	Physocarpus capitatus	dcsh	3.6	
* oak, Garry	Quercus garryana	brtr	3.2	

APPENDIX 1b (cont'd 5)

Common Name	Latin Name	Life-form	EISG no.	Page no. for ID
oatgrass, California	Danthonia californica	gram	2.1	
oatgrass, poverty	Danthonia spicata	gram	2.1	
*ocean spray	Holodiscus discolor	dcsh	2.1	79
*oenanthe, Pacific	Oenanthe sarmentosa	herb	3.7	
onion, Hooker's	Allium acuminatum	herb	3.2	
onion, nodding	Allium cernuum	herb	3.2	
oniongrass, Alaska	Melica subulata	gram	3.4	
*Oregon grape, dull	Mahonia nervosa	evsh	2.2	82
*Oregon grape, tall	Mahonia aquifolium	evsh	3.2	81
*partridge foot	Luetkea pectinata	herb	2.4	
*pathfinder	Adenocaulon bicolor	herb	3.3	
peavine, creamy	Lathyrus ochroleucus	herb	3.4	
peavine, purple	Lathyrus nevadensis	herb	3.3	
*piggy back plant	Toimiea menziesii	herb	3.5	
*pinedrops	Pterospora andromedea	pasa	2.1	
*pinegrass	Calamagrostis rubescens	gram	3.3	
pinemap	Hypophyllum lanuginosa	pasa	1.3	
*pipisseewa, Menzies	Chimaphila menziesii	evsh	1.4	95
polypody, leatherleaf	Polypodium scolopendri	fern	3.5	
*prince's pine	Chimaphila umbellata	evsh	1.2	96
*queen's cup	Clintonia uniflora	herb	1.4	97
*raspberry, black	Rubus leucodermis	dcsh	3.4	
*raspberry, red	Rubus idaeus	dcsh	3.4	
*raspberry, trailing	Rubus pubescens	evsh	3.5	
*rattlesnake plantain	Goodyera oblongifolia	herb	1.3	101
rattlesnake root, western	Prenanthes alata	herb	3.5	
reedgrass, Pacific	Calamagrostis nutkaensis	gram	3.5	
*rein orchid, round leaved	Platanthera orbiculata	herb	1.3	
*rhododendron, white flowered	Rhododendron albiflorum	dcsh	1.4	86
*rose, baldhip	Rosa gymnocarpa	dcsh	1.3	
*rose, prickly	Rosa acicularis	dcsh	3.4	
rosemary, bog	Andromeda polifolia	herb	1.7	
rush, common	Juncus effusus	gram	3.7	
rush, dagger leaved	Juncus ensifolius	gram	3.7	
St John's wort, western	Hypericum formosum	herb	2.3	
*salal	Gaultheria shallon	evsh	1.4	78
*salmonberry	Rubus spectabilis	dcsh	3.6	87
sandwort, big leaved	Moehringia macrophylla	herb	3.3	
sanicle, Sierra	Sanicula graveolens	herb	3.2	
*sarsaparilla, wild	Aralia nudicaulis	herb	3.4	
*Saskatoon	Amelanchier alnifolia	dcsh	2.2	74
satin flower	Sisyrinchium douglasii	herb	3.3	
scouring rush	Equisetum hyemale	fern	3.5	
sedge, Dewey's	Carex deweyana	gram	3.6	
sedge, Henderson's	Carex hendersonii	gram	3.6	
sedge, long stolonied	Carex pensylvanica	gram	3.1	
sedge, pale	Carex livida	gram	3.7	
sedge, Ross	Carex rossii	gram	3.2	
sedge, slough	Carex obnupta	gram	3.7	

APPENDIX 1b (cont'd 6)

Common Name	Latin Name	Life form	EISG no.	Page no. for ID
sedge, smooth stemmed	Carex laeviculmis	gram	37	
sedge, water	Carex aquatilis	gram	37	
* selaginella, Wallace's	Selaginella wallacei	fern	31	
shootingstar, broad leaved	Dodecatheon hendersonii	herb	34	
shootingstar, few flowered	Dodecatheon pulchellum	herb	34	
* single delight	Moneses uniflora	herb	24	
* skunk cabbage	Lysichiton americanum	herb	37	102
snake root, western	Sanicula crassicaulis	herb	33	
* snowberry, common	Symphoricarpos albus	dcsh	34	
snowberry, creeping	Gaultheria hispida	evsh	15	
* snowberry, trailing	Symphoricarpos hesperius	dcsh	32	
* Solomon's seal, false	Smilacina racemosa	herb	34	106
* Solomon's seal, star flowered false	Smilacina stellata	herb	34	107
* soaplallie	Shepherdia canadensis	dcsh	33	
* spirea, birch leaved	Spiraea betulifolia	dcsh	33	88
* spirea, pink	Spiraea menziesii	dcsh	36	
spirea, subalpine	Spiraea densiflora	dcsh	23	
* spleenwort, maidenhair	Asplenium trichomanes	fern	22	
* starflower, broad leaved	Trientalis latifolia	herb	33	
starflower, northern	Trientalis arctica	herb	17	
starwort, crisp	Stellaria crispa	herb	36	
* stonecrop, broad leaved	Sedum spathulifolium	herb	31	
* sundew, round leaved	Drosera rotundifolia	herb	17	
sunflower, woolly	Eriophyllum lanatum	herb	31	
* sweet cicely, mountain	Osmorhiza chilensis	herb	35	
* sweet gale	Myrica gale	dcsh	37	
tarweed, woodland	Madia madioides	herb	32	
* tea berry, western	Gaultheria ovatifolia	evsh	12	77
* thimbleberry	Rubus parviflorus	dcsh	34	
toad flax, bastard	Geocaulon lividum	herb	15	
* trillium	Trillium ovatum	herb	35	
trisetum, nodding	Trisetum cernuum	gram	35	
twayblade, broad leaved	Listera convallarioides	herb	37	
* twayblade, heart leaved	Listera cordata	herb	14	
* twayblade, northwestern	Listera banksiana	herb	24	
* twinberry, black	Lonicera involucrata	dcsh	35	
* twinberry, red	Lonicera utahensis	dcsh	23	
* twinflower	Linnaea borealis	evsh	14	
* twistedstalk, clasping	Streptopus amplexifolius	herb	35	108
* twistedstalk, rosy	Streptopus roseus	herb	35	109
* twistedstalk, small	Streptopus streptopoides	herb	15	
valerian, Scouler's Sitka	Valeriana scouleri	herb	36	
* valerian, Sitka	Valeriana sitchensis	herb	36	
* vanilla leaf	Achlys triphylla	herb	34	94
vetch, American	Vicia americana	herb	23	
* violet, early blue	Viola adunca	herb	22	
* violet, round leaved	Viola orbiculata	herb	13	
* violet, stream	Viola glabella	herb	36	
* violet, trailing yellow	Viola sempervirens	herb	22	

APPENDIX 1b

Common Name	Latin Name	Life form	EISG no.	Page no. for I.D.
* wheatgrass, bluebunch	Agropyron spicatum	gram	3.1	
wildrye, blue	Elymus glaucus	gram	3.3	
willow, Hooker's	Salix hookeriana	dcsh	3.6	
willow, Scouler's	Salix scouleriana	dcsh	2.3	
wintergreen, alpine	Gaultheria humifusa	evsh	1.5	
* wintergreen, green	Pyrola chlorantha	herb	2.3	
wintergreen, Nootka	Pyrola dentata	herb	2.1	
* wintergreen, one-sided	Orthilia secunda	herb	1.3	103
* wintergreen, pink	Pyrola asarifolia	herb	2.3	104
* wintergreen, white-veined	Pyrola picta	herb	2.3	
wood reed, nodding	Cinna latifolia	gram	3.6	
woodrush, many-flowered	Luzula multiflora	gram	2.1	
* woodrush, small-flowered	Luzula parviflora	gram	2.4	
yampah	Penderidia gairdneri	herb	3.3	
yarrow, western	Achillea lanulosa	herb	3.2	
yerba buena	Satureja douglasii	evsh	3.2	
* yew, western	Taxus brevifolia	cntr	3.4	
Yorkshire fog	Holcus lanatus	gram	2.3	

Codes to life-form

cntr	-	coniferous trees
brtr	-	broad-leaved trees
dcsh	-	deciduous shrubs
evsh	-	evergreen shrubs
fern	-	ferns and fern-allies
gram	-	graminoids, grasses and related plants
herb	-	herbs
pasa	-	parasites and saprophytes
moss	-	mosses
lvrt	-	liverworts
lchn	-	lichens

APPENDIX II

Identification of common indicator plant species¹

The purpose of this section is to assist forestry staff with the field identification of selected indicator plant species that occur in the Vancouver Forest Region. Many of the plant species included in this section are found on the edatopic grids. Recognition of these indicator plants is therefore a helpful tool in the identification and interpretation of various forest ecosystems. However, it should be emphasized that the use of indicator plant species is only part of site diagnosis and should not preclude the understanding and use of environmental features.

Contained in this guide are 60 commonly occurring plant species, which should not be considered a comprehensive guide to flora of the Vancouver Forest Region. Illustrations and descriptions are intended to be simple yet accurate. Descriptions tend to focus on those easily recognizable features which help to distinguish plants from one another. Those plants which cannot be readily identified should be collected for a more thorough examination. For a more detailed list and description of vegetation, the reader should refer to other publications available (see references).

Comments relating to each plant species describe general characteristics with which they are often associated. Plants may not, however, conform to these characteristics due to site or plant variability. Where differences occur, the user should pay particular attention to other site or plant features used in site diagnosis. The information presented on the distribution and ecological behavior of the plant species was derived from Krajina *et al.* 1984, and field observations.

The plants have been organized into four main life-form groups: 1) Shrubs, 2) Herbs, 3) Ferns, and 4) Lichens and Mosses. Within each group, plants are arranged alphabetically according to their scientific name.

The use of plant species field ID cards allows the user to retain those cards pertinent to the area while removing those less relevant. Thus a personal editing of cards can be made. In the future it is hoped that additional species cards will be produced which could be easily incorporated into the field guide as needed.

Scientific nomenclature follows Crum *et al.* 1973 (mosses) and Taylor and MacBryde 1977 (vascular plants), modified by Krajina in Krajina *et al.* 1984. Information used in this guide has largely been abstracted from the references listed below, with illustrations derived specifically from Hitchcock *et al.* 1955, 1959, 1961, 1964, 1969; Jones *et al.* 1983; Schofield 1969; Szczawinski 1959, 1962; Taylor 1956, 1966, 1973; and from P. Frank, Ministry of Forests.

Angove, K., and B. Bancroft. 1983. A guide to some common plants of the southern Interior of British Columbia. B.C. Ministry of Forests, Land Management Handbook No. 7. 225p.

Coupe, R., C.A. Ray, A. Comeau, M.V. Ketcheson and R.M. Annas. 1982. A guide to some common plants of the Skeena area, British Columbia. B.C. Ministry of Forests, Land Management Handbook No. 4. 215 p.

Crum, H.A., W.C. Steere and L.E. Anderson. 1973. A new list of mosses of North America north of Mexico. *The Bryologist* 73: 499-543.

¹ This section was prepared by R.J. Slaco, B.C. Forest Products Ltd., and C.A. Ray, Ministry of Forests.

Hitchcock, C.L., A. Cronquist, M. Ownbey, and J.W. Thompson. 1955, 1959, 1961, 1964, 1969. Vascular plants of the Pacific Northwest. Vols. 1-5. University of Washington Press, Seattle, Wash.

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Krajina, V.J., K. Klinka, S. Kojima, and E.B. Peterson. 1984. Ecology of vascular plants of British Columbia. Department of Botany, University of British Columbia (in manuscript).

Schofield, W.B. 1969. Some common mosses of British Columbia. B.C. Provincial Museum Handbook Series No 28, Victoria. 124 p.

Szczawinski, A.F. 1959. Orchids of British Columbia. B.C. Provincial Museum Handbook Series No 16, Victoria. 124 p.

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APPENDIX II (continued)

Shrub

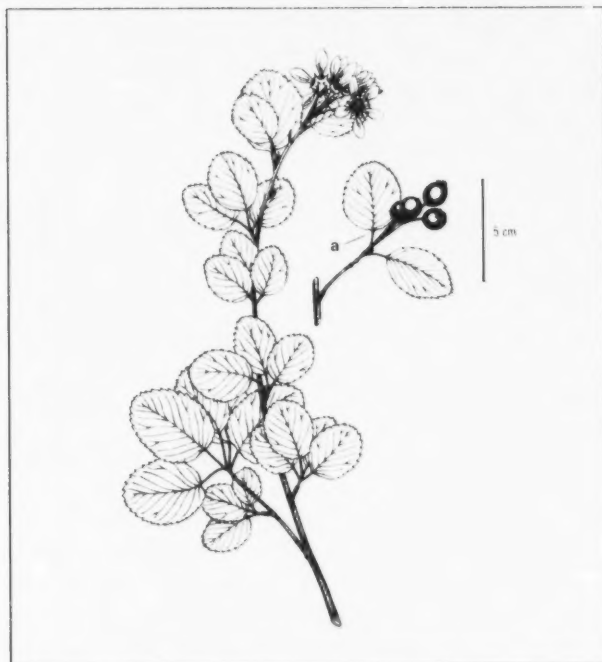
Amelanchier alnifolia

Saskatoon

EISG No. 2.2

Dry to fresh

Nutrient - medium



General: deciduous shrub to small tree, up to 7 m tall

Leaves: round or oval with margins sharply serrated almost all around the leaf. Indented where leaf stalk joins leaf (a).

Flowers: showy white cluster of 3 - 20 at tip of branch.

Fruit: purple to black berry.

Comments: a common, moderately shade-tolerant to shade-intolerant deciduous shrub that is characteristic of: i) the IDF and CDF; ii) thin, friable Mors and Moders; and iii) recently disturbed sites and semi-open, seral Fd and PI ecosystems.

N.B. may be confused with *Spiraea betulifolia*

APPENDIX II (cont'd 2)

Shrub

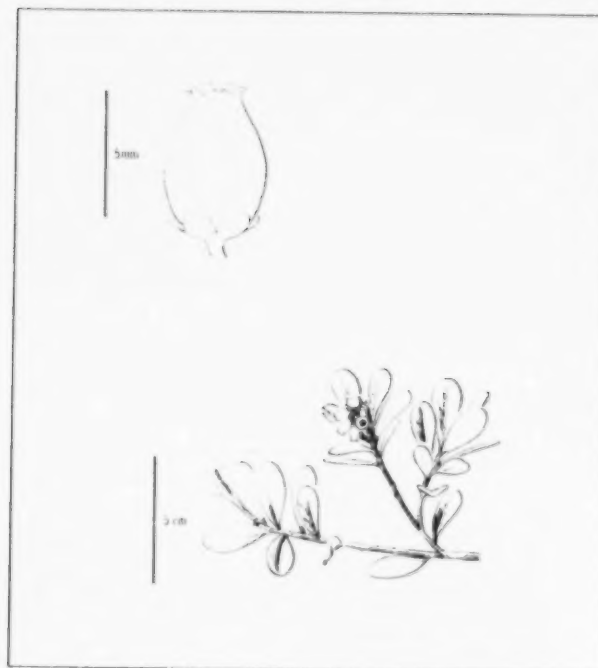
Arctostaphylos uva-ursi

Kinnikinnick

EISG No. 2.1

Very dry to dry

Nutrient-(poor to
medium)



- General: evergreen, trailing, forms mats.
- Leaves: leathery, smooth edges, dark green and shiny above, oval-shaped.
- Flowers: few in cluster at end of branch, urn-shaped, white or pinkish tinged.
- Fruit: bright red berry.
- Comments: a common, moderately shade-tolerant evergreen semi-shrub that is characteristic of: i) thin Mors and Moders, typically underlain by shallow or coarse textured soil; and ii) non-forested or sparsely forested Fd or Pl ecosystems of low productivity.

APPENDIX II

Shrub

Cornus sericea

Red-osier dogwood

EISG No. 3.6

Moist to wet

Nutrient-medium
to very rich



- General: deciduous, erect and spreading, many stems, 2 - 6 m tall, opposite branching, stems usually red.
- Leaves: opposite, strongly veined, oval.
- Flowers: white, in flat topped cluster.
- Fruit: white berry.
- Comments: A common, moderately shade-tolerant deciduous shrub that is characteristic of: i) Moder or Muls (including their saturated forms); and ii) submontane to montane, active floodplain ecosystems with productive growth of Ac, Cw, and Ss. It is a vigorously competing brush species on cutover sites.

APPENDIX II

Shrub

Gaultheria ovatifolia

Western tea-berry

EISG No. 1.2

Very dry to dry

Nutrient-very poor
to medium



- General low evergreen spreading shrub, stems creeping, branches erect, branches covered with brownish hairs.
- Leaves leathery, oval, pointed tip, finely serrated
- Flowers white or pinkish, bell-shaped, single flower at axils (between leaf and stem).
- Fruit scarlet berry
- Comments less common, moderately shade-tolerant, evergreen shrub that is characteristic of: i) the submaritima to subcontinental MH, ESSF, IDF, and CDF (its abundance increases from west to east through the Region), also common in the MH on the leeward side of Vancouver Island; ii) Mors, and iii) ecosystems of low to poor productivity.

APPENDIX II

Shrub

Gaultheria shallon

Salal

EISG No. 1.4

Dry to moist

Nutrient-very poor
to medium



- General: evergreen, erect or spreading up to 2.5 m tall, hairy stems
- Leaves: leathery, egg shaped, finely serrated
- Flowers: white or pink, urn shaped, lined up on one side of a flowering stem
- Fruit: reddish-blue to nearly black berry, covered with tiny hairs
- Comments: a very common, moderately shade tolerant evergreen shrub that is characteristic of: i) the CDF and CWH (its abundance decreases from west to east through the Region), ii) Mors, and iii) early seral to climax Fd, Cw or Hw ecosystems of low to poor productivity. On nutrient-richer sites it is typically found growing in decaying wood. On cutover sites it often forms a dense thicket which hinders regeneration

APPENDIX II (continued)

Shrub

Holodiscus discolor

Ocean-spray

EISG No. 2.1

Very dry to dry

Nutrient-medium



- General: deciduous, erect, slender, up to 4m tall, with arching branches, brownish peeling bark.
- Leaves: oval to egg-shaped, shallowly lobed or double-toothed (a), smooth above, woolly below.
- Flowers: numerous tiny white to creamy coloured flowers in a large drooping branched cluster (b), flowers turn brown with age, and often persist on branches well into the autumn.
- Comments: a common, moderately shade-tolerant, deciduous shrub that is characteristic of: i) the CDF and IDF; ii) thin, friable Mors and Moders; and iii) disturbed cutover sites and seral Fd ecosystems.

APPENDIX II (cont'd 3)

Shrub

Juniperus scopulorum

Rocky Mountain juniper

EISG No. 3.1

Very dry

Nutrient-medium
(-to rich)



General: evergreen, erect shrub to small tree, 1 - 10m tall, shaggy appearance, branches upward and spreading.

Leaves: scale-like on four-sided branches (a), mostly opposite, juvenile leaves needle-like (b).

Fruit: bright blue berry with a whitish coating.

Comments: a less common, shade-intolerant coniferous shrub that is characteristic of: i) the drier CDF and IDF (its abundance increases from west to east through the Region); ii) thin Modors or Rhizomulls; iii) calcium-rich soils; and iv) sparsely forested ecosystems of low productivity (rock outcrops and steep south-facing slopes).

APPENDIX II *Forest ID*

Shrub

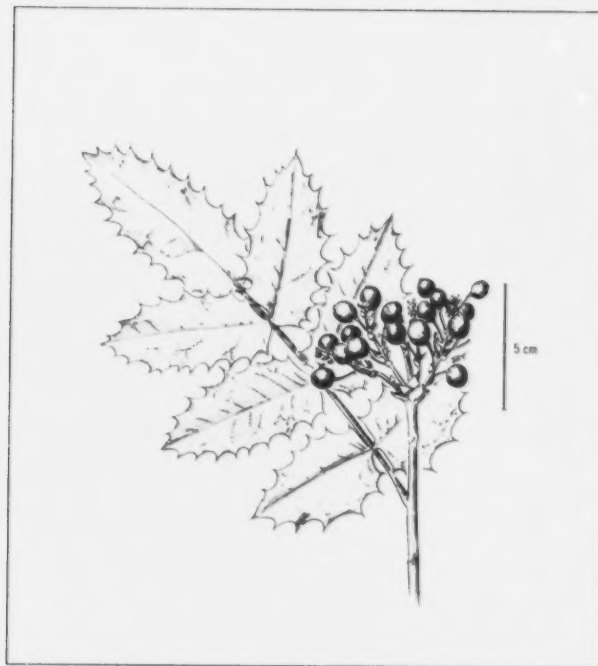
Mahonia aquifolium

Tall Oregon-grape

EISG No. 3.2

Very dry to dry

Nutrient- medium
to very rich



General: evergreen, holly like, mainly erect, stiffly branched, 15 - 20 (45) cm tall.

Leaves: leathery, 5 - 9 leaflets, shiny on top, spine-tipped teeth, veins branch off midrib.

Flowers: yellow cluster.

Fruit: blue berries with whitish waxy covering.

Comments: a common, moderately shade-intolerant evergreen shrub that is characteristic of: i) the drier CDF and IDF; ii) thin Moders and Mulls; and iii) well-drained Fd ecosystems.

APPENDIX II (cont'd 11)

Shrub

EISG No. 2.2

Mahonia nervosa

Dry to fresh

Dull Oregon-grape

Nutrient-medium



General: evergreen, holly-like, short 10 - 30 (60) cm tall, stiffly branched.

Leaves: leathery, 9 - 19 leaflets, dull on top, spine-tipped teeth, veins branch from leaf base.

Flowers: yellow cluster.

Fruit: blue berries with whitish waxy covering.

Comments: a common, moderately shade-tolerant evergreen shrub that is characteristic of: i) the CDF and drier CWH (its abundance decreases from west to east through the Region); ii) thin, friable Mors and Moders; and iii) well-drained Fd ecosystems.

APPENDIX II

Shrub

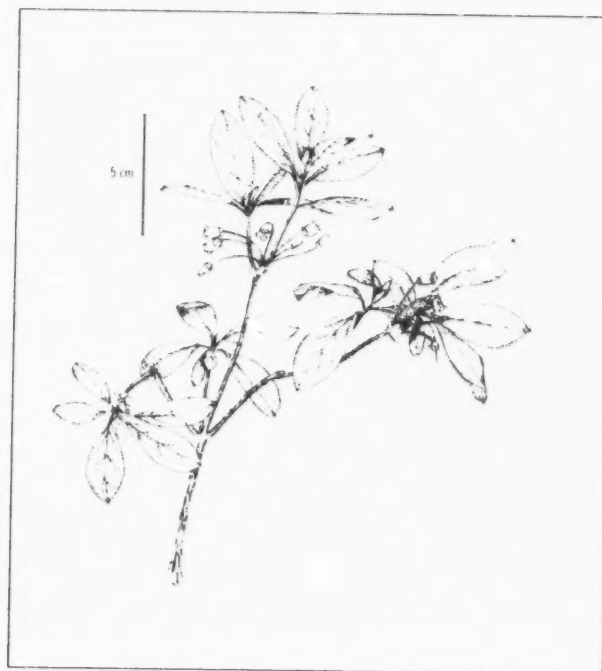
Menziesia ferruginea

False azalea

EISG No. 1.5

Fresh to moist

Nutrient-very poor
to medium



- General: deciduous, erect to spreading, up to 2 m tall, scaly bark on older branches, young twigs covered with fine hairs.
- Leaves: widest from middle to tip, tapers at both ends, serrated margins, covered with tiny hairs, bluey-green, opposite branching but whorl-like appearance, skunky smell when crushed.
- Flowers: urn-shaped, small, yellowish with red tinge, on droopy long stalks, clusters at branch tips on last year's growth.
- Fruit: persistent oval capsule.
- Comments: a common, shade-tolerant deciduous shrub that is characteristic of: i) the wetter CWH and lower MH; ii) Mors; and iii) Hw and Hm ecosystems of medium productivity. On wetter or nutrient-richer sites it typically grows on decaying wood.
- N.B.
83
- may be confused with *Rhododendron albiflorum*.

APPENDIX II *continued* 135

Shrub

Oplopanax horridus

Devil's club

EISG No. 3.6

Moist to wet

Nutrient-medium
to very rich



General: deciduous, erect to slightly spreading, 1 - 3 m tall, thick, heavily spined stem.

Leaves: large maple-leaf shape, spines on underside veins, serrated

Flowers: elongated cluster of small flowers.

Fruit: bright red flattened berries.

Comments: a common, moderately shade-tolerant deciduous shrub that is characteristic of: i) subarctic to continental climates, although it also occurs in maritime climates (its abundance increases from west to east through the Region); ii) Moders and Muls; iii) seepage, floodplain and stream-edge sites; and iv) ecosystems of high productivity.

APPENDIX II Plant 1.3

Shrub

Paxistima myrsinites

Falsebox

EISG No. 1.3

Dry to fresh

Nutrient-very poor
to medium



General: evergreen, erect to flat on the ground, up to 60 cm tall, squarish branches.

Leaves: leathery, opposite, oval to elliptical, serrated edges.

Flowers: numerous small red flowers (a) arising from the axils (between leaf and stem).

Comments: a common, shade-tolerant evergreen shrub that is characteristic of: i) the submontane CWH and MH, the upper IDF and lower ESSF and the CDF and CWH on the leeward side of Vancouver Island (it replaces edatopically similar *Gaultheria shallon* from west to east through the Region); and ii) Mors. On wetter or nutrient-richer sites it typically grows on decaying wood.

APPENDIX II (Continued)

Shrub

EISG No. 1.4

Rhododendron albiflorum

Dry to moist

White-flowered rhododendron

Nutrient-very poor
to medium



General: deciduous, erect 1 - 2 m tall, peeling bark, young twigs with reddish hairs.

Leaves: widest from middle to tip, tapers at both ends, smooth edges, glossy yellowish-green, reddish hairs underneath, whorl-like appearance.

Flowers: large white showy clusters of 1 to 4 flowers.

Comments: a common, moderately shade-tolerant deciduous shrub that is characteristic of: i) the upper MH and ESSF (its abundance increases from west to east through the Region); and ii) Mors, grading towards Moders. It often persists as a brush species on cutover areas. On nutrient-rich sites it is found on decaying wood.

N.B. may be confused with *Menziesia ferruginea*.

APPENDIX II

Shrub

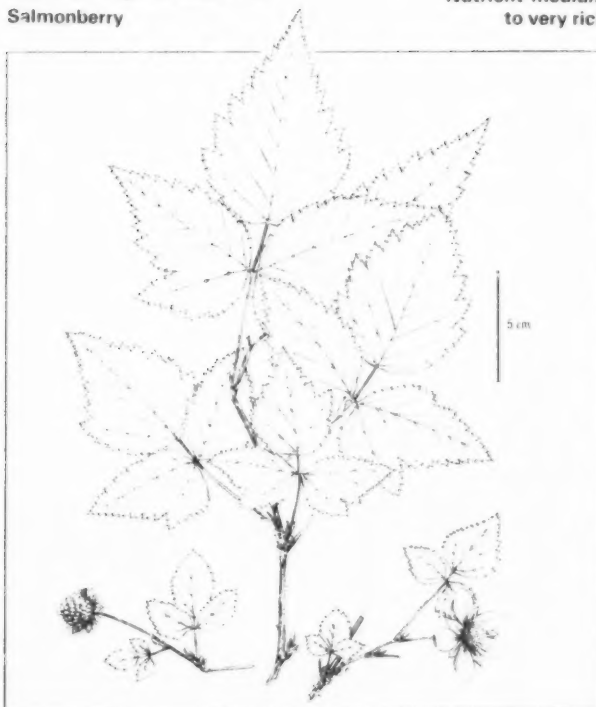
Rubus spectabilis

Salmonberry

EISG No. 3.6

Moist to wet

Nutrient-medium
to very rich



General deciduous, thicket-forming, stems erect to arching, up to 4 m tall, often spined, shredding brown bark

Leaves 3 oval-shaped leaflets, slightly lobed, serrated

Flowers usually 1, sometimes 2-4, on short leafy branches, petals pink to reddish purple

Fruit yellow or red, raspberry shaped

Comments a common, moderately shade tolerant deciduous shrub that is characteristic of: i) the hypermaritime and maritime CWH (it is replaced by edatopically similar *Rubus parviflorus* from west to east through the Region); ii) Moders and Muls (including their saturated forms); iii) seepage, floodplain and stream-edge sites; and iv) ecosystems of high productivity. It is a vigorously competing brush species on cutover sites.

APPENDIX II (cont'd 3.2)

Shrub

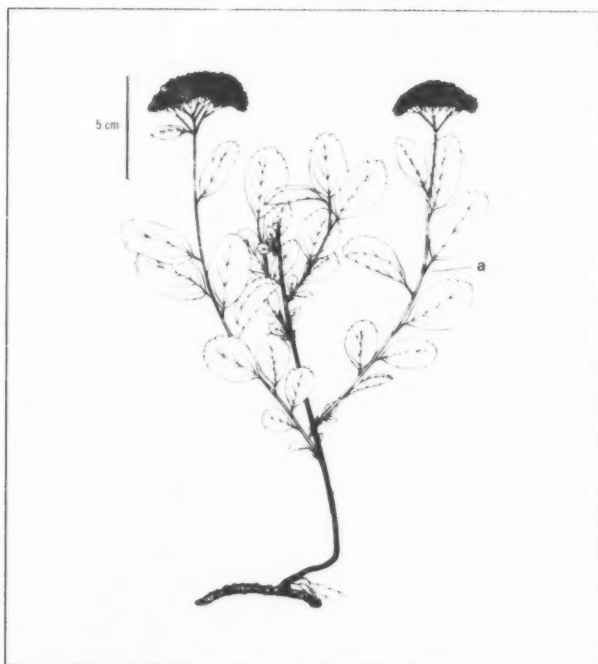
Spiraea betulifolia

Birch-leaved spirea

EISG No. 3.3

Dry to fresh

Nutrient-medium
to very rich



General: deciduous, erect, 25 - 60 (90) cm tall.

Leaves: egg-shaped, often coarsely toothed above middle, taper where they join the leaf stalk (a).

Flowers: numerous, tiny, dull white, with pale lavender or pinkish tinge, in large flat-topped cluster.

Comments: a common, moderately shade-tolerant deciduous shrub that is characteristic of: i) the IDF and ESSF; ii) thin, friable humus forms, and iii) Fd ecosystems.

N.B. may be confused with *Amelanchier alnifolia*.

APPENDIX II *Forest of the*

Shrub

Spiraea douglasii

Hardhack

EISG No. 1.6

Moist to wet

Nutrient-very poor
to medium



General: deciduous, erect, multi-branched up to 2 m tall

Leaves: oval, serrated above the middle, with many small white hairs on the underside

Flowers: elongated, dense, narrow cluster of small, deep rose coloured flowers, turning brown with age

Comments: a common, shade-tolerant deciduous shrub that is characteristic of: i) the CDF and CWH; ii) saturated Mors and Moders, typically underlain by gleyed or organic soil; and iii) waterlogged non-forested ecosystems.

APPENDIX II

Shrub

Vaccinium alaskaense

Alaskan blueberry

EISG No. 1.5

Fresh to moist

Nutrient - very poor
to medium



General: deciduous, erect, up to 1.5 m tall with yellowish-green, slightly to moderately angled twigs, older branches greyish.

Leaves: oval, margins smooth or slightly serrated, dark green above paler below, glandular hairs on the underside midrib.

Flowers: bronze to pinkish-green, appearing when leaves come out.

Fruit: bluish-black to reddish-black berry.

Comments: a common, shade-tolerant deciduous shrub that is characteristic of: i) the hypermaritime to maritime, wetter CWH and lower MH (its abundance decreases from west to east through the Region); ii) Mors; and iii) Hw and Hm ecosystems of poor to medium productivity. On nutrient-richer sites it typically grows on decaying wood. It often persists on cutover areas.

APPENDIX II *World 200*

Shrub

Vaccinium membranaceum

Black huckleberry

EISG No. 1.3

Dry to fresh

Nutrient-very poor
to medium



- General: deciduous, erect, 0.5 to 2 m tall, young branches yellowish-green, slightly angled, older branches greyish with shredding bark, densely branched.
- Leaves: distinctly serrated, pointed.
- Flowers: creamy coloured.
- Fruit: purplish-black berry, without whitish coating.
- Comments: a common, moderately shade-tolerant shrub that is characteristic of: i) the MH, ESSF, and montane wetter CWH and IDF (its abundance increases from west to east through the Region); and ii) Mors. On nutrient-rich sites it typically grows on decaying wood. It often persists on cutover areas.

APPENDIX II

Shrub

Vaccinium ovalifolium

Oval-leaved blueberry

EISG No. 2.3

Dry to moist

Nutrient medium



- General** deciduous, slender, up to 1.5 m tall, fine twigs brownish (or yellowish), older branches grey, stems slightly angled to round, densely branched
- Leaves** oval-shaped, blunt at both ends, edges smooth or slightly serrated
- Flowers** pinkish, appear before leaf emergence or during early leaf development
- Fruit** bluish black or purplish black berry with whitish coating.
- Comments** a common, shade-tolerant deciduous shrub that is characteristic of: i) the MH, ESSF and montane wetter CWH; and ii) Mors, grading towards Moders. It often persists on cutover areas

APPENDIX II (continued)

Shrub

Vaccinium parvifolium

Red huckleberry

EISG No. 13

Dry to fresh

Nutrient - very poor
to medium



- General: older leaves deciduous, juvenile leaves evergreen, erect, up to 4 m tall with slender green sharply angled young branches.
- Leaves: oval, older leaves have smooth edges, juvenile leaves are finely serrated (a).
- Flowers: greenish-yellow or pinkish, urn-shaped.
- Fruit: pinkish-red berry.
- Comments: a common moderately shade-tolerant partly deciduous shrub that is characteristic of: i) the CDF and CWH (its abundance decreases from west to east through the Region; and ii) Mors. On nutrient-richer sites it typically grows on decaying wood. It often persists on cutover areas.

APPENDIX II

Herb

Achlys triphylla

Vanilla leaf

EISG No. 3.4

Dry to moist

Nutrient-medium
to very rich



General: erect, single stem.

Leaves: single large round leaf divided into 3 leaflets that are almost triangular in shape with outer edge rounded and wavy.

Flowers: separate flowering stem from the base, cluster of numerous small white flowers at the top of the stem.

Comments: a common, moderately shade-tolerant herb that is characteristic of i) the CDF and drier CWH (its abundance decreases from west to east through the Region); ii) Moders and Muls (rarely found on Mors); and iii) Fd ecosystems of medium to high productivity.

APPENDIX II (continued)

Herb

Chimaphila menziesii

Menzies' pipsissewa

EISG No. 1.4

Dry to moist

Nutrient-very poor
to medium



General: evergreen, stem red, erect, up to 20 cm tall.

Leaves: leathery, shiny green, alternate, somewhat serrated, lower half of leaf wider than upper half (a).

Flowers: 1 - 3 on short stalks at the top of the stem, white to pinkish.

Comments: a shade-tolerant, evergreen semi-shrub that is characteristic of the CDF and CWH, and Mors.

N.B. this evergreen semi-shrub is included in the herb group because of its similar form.

APPENDIX II (cont'd 25)

Herb

Chimaphila umbellata

Prince's pine

EISG No. 1.2

Very dry to dry

Nutrient-very poor
to medium



General: evergreen, stem green, erect, up to 35 cm tall.

Leaves: whorled, bright shiny green above and dull below, widest near tip, tapers to the base (a), serrated.

Flowers: 3 - 15 in small loose cluster, white to pink and waxy.

Comments: a very common, moderately shade-tolerant evergreen semi-shrub that is characteristic of: i) the CDF, drier CWH, and IDF (its abundance increases from west to east through the Region); and ii) Mors.

N.B. this evergreen semi-shrub is included in the herb group because of its similar form.

APPENDIX II (cont'd 26)

Herb

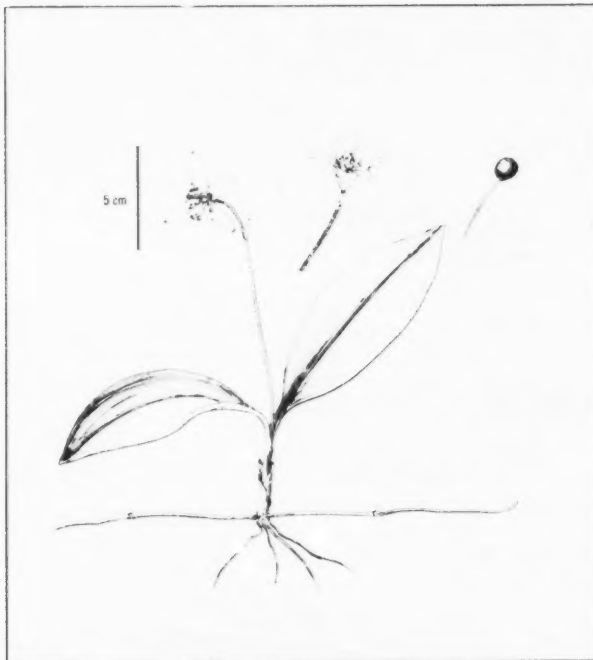
Clintonia uniflora

Queen's cup

EISG No. 1.4

Dry to moist

Nutrient-very poor
to medium



General: perennial, single flowering stem.

Leaves: 2 - (3), large, yellowish green, oblong, slightly fleshy (glossy), with fine hairs on the leaf margins.

Flowers: 1 - (2) large showy white.

Fruit: single, bright metallic blue berry.

Comments: a common, shade-tolerant, bulbous herb that is characteristic of:
i) the wetter IDF and CWH, and lower MH and ESSF; and ii) Mors.
On nutrient-richer sites it typically grows on decaying wood.

APPENDIX II (cont'd 27)

Herb

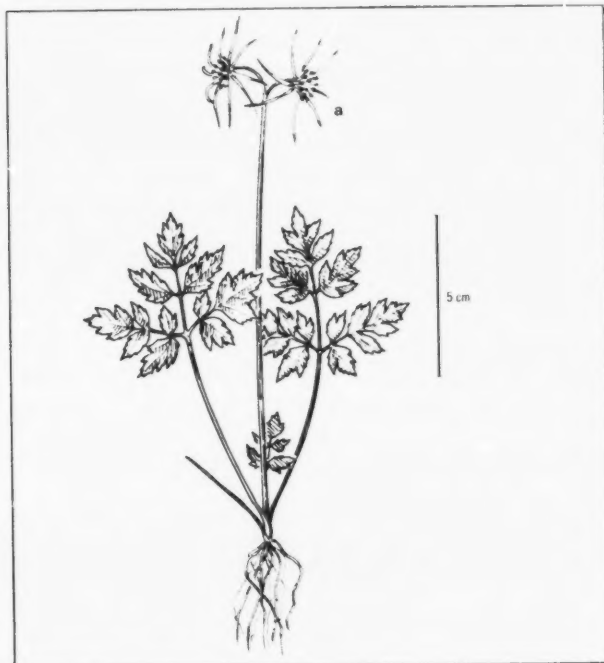
Coptis aspleniifolia

Fern-leaved goldthread

EISG No 1.6

Moist to wet

Nutrient-very poor
to medium



General: small, 9 – 35 cm tall.

Leaves: basal, fern-like, deeply lobed and serrated.

Flowers: 2 – 3 flowers on a leafless stem (5 – 25 cm tall), thread-like flower parts (a).

Roots: bright yellow.

Comments: a less common, shade-tolerant herb that is characteristic of : i) the montane wetter CWH and lower MH; ii) humus forms which feature a thick greasy H horizon, often saturated with groundwater; and iii) *Blechnum spicant* ecosystems dominated by Hm or Hw and lower productivity *Lysichitum americanum* ecosystems dominated by Cw or Yc.

APPENDIX II (cont'd 28)

Herb

Disporum hookeri

Hooker's fairybells

EISG No. 3.4

Dry to moist

Nutrient medium
to very rich



General: few branches, straw coloured, woody-looking stem, up to 1 m tall.

Leaves: oval to elliptical, fine hairs on leaf margins all pointing towards the tip (a).

Flowers: 2 - 3 at the tips of branches, creamy white, narrow bell-shaped.

Fruit: red berry.

Comments: a common, moderately shade-tolerant herb that is characteristic of:
i) the CDF, and IDF (its abundance increases from west to east through the Region); ii) Moders and Mulls; and iii) ecosystems of high productivity.

N.B.

may be confused with *D. trachycarpum* and *Streptopus amplexifolius*.

APPENDIX II (continued)

Herb

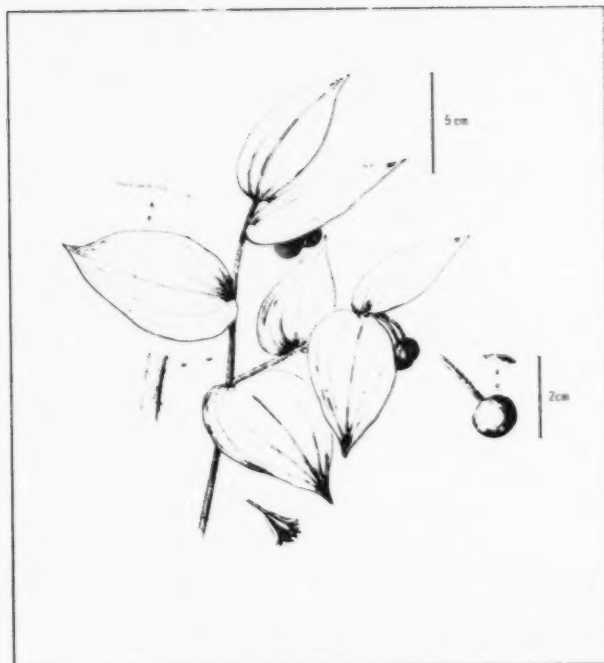
Disporum trachycarpum

Rough-fruited fairybells

EISG No. 3.4

Dry to moist

Nutrient-medium
to very rich



General: few branches, stems erect, straw coloured and woody-looking, up to 70 cm tall.

Leaves: oval to elliptical, fine hairs on leaf margins point randomly not forward.

Flowers: 1 - 2 at the tips of branches, creamy white, narrow bell-shaped.

Fruit: red berry, with velvet texture.

Comments: a common, moderately shade-tolerant herb that is characteristic of: i) the IDF; ii) Moders and Mulls; and iii) Fd ecosystems of medium to high productivity.

N.B. may be confused with *D. hookeri* and *Streptopus amplexifolius*.

APPENDIX II (cont'd 30)

Herb

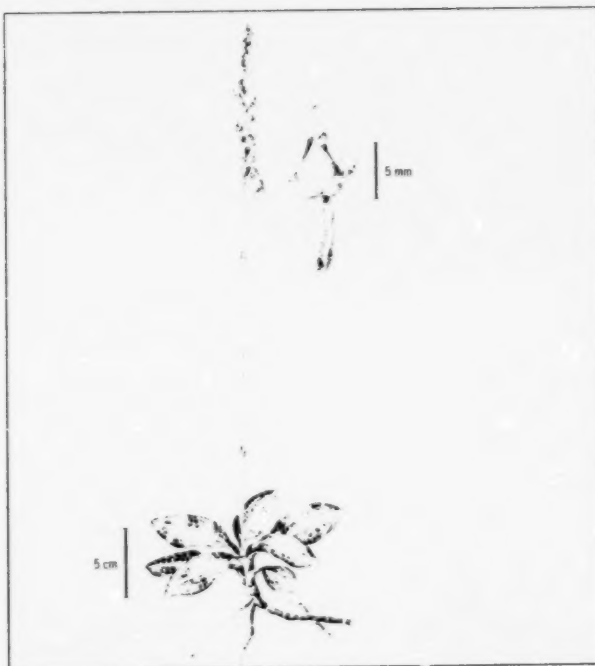
Goodyera oblongifolia

Rattlesnake-plantain

EISG No. 1.3

Dry to fresh

Nutrient-very poor
to medium



General: evergreen, 25 - 40 cm tall.

Leaves: at the base only, rosette pattern, leathery, thick, mottled or striped with white especially along midrib.

Flowers: many, dull white to green, oriented along upper end of central flowering stalk.

Comments: a common, shade-tolerant herb that is characteristic of Mors, grading towards Moders. On wetter or nutrient-richer sites it typically grows on decaying wood.

APPENDIX II

EISG No. 3.7

Herb

Wet

Lysichitum americanum

Nutrient-medium
to very rich

Skunk cabbage



General: short, stout, erect, underground stem.

Leaves: large, can be longer than 1 m, fleshy, glossy green, skunk like odor

Flowers: small, in dense cluster on erect fleshy stalk surrounded by a yellow hood-like sheath.

Comments: a conspicuous, moderately shade-tolerant herb that is characteristic of: i) gleysolic or organic soils featuring a high groundwater table; ii) saturated Moders and Mulls; and iii) submontane to sub-alpine waterlogged ecosystems dominated by Cw or Yc of poor to medium productivity.

APPENDIX II (cont'd 32)

Herb

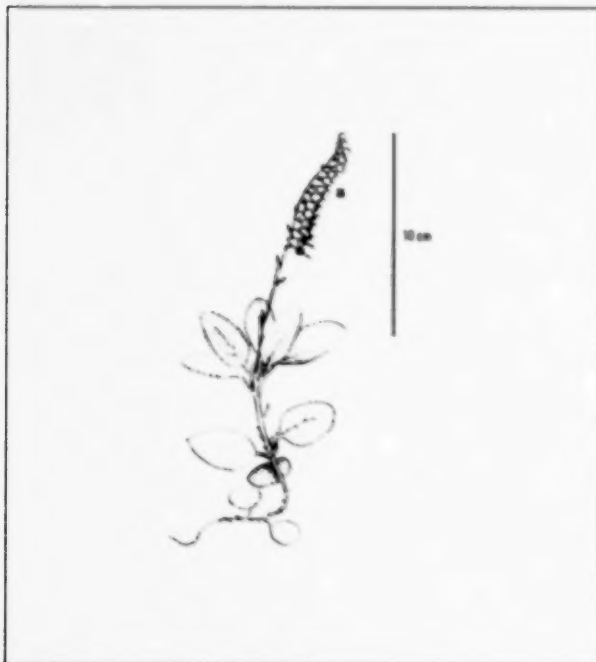
Orthilia secunda

One-sided wintergreen

EISG No. 1.3

Dry to fresh

Nutrient-very poor
to medium



General: evergreen, stem single erect, up to 20 cm tall.

Leaves: egg-shaped, serrated, darker green above, paler below.

Flowers: 16 - 20, light green to white, lined up on one side of the stem (a).

Comments: a very common, shade-tolerant herb that is characteristic of: i) Mors; and ii) submontane to subalpine Hw and Hm ecosystems. On nutrient-rich sites it may grow on decaying wood.

APPENDIX II (cont'd 33)

Herb

Pyrola asarifolia

Pink wintergreen

EISG No. 2.3

Dry to moist

Nutrient-medium



General: evergreen perennial, up to 40 cm tall (with flowering stem).

Leaves: leathery, spreading from the base, leaf stem longer than leaf, circular, shiny dark green on top, purplish beneath.

Flowers: 10 - 25, pink to purplish-red in a loose cluster along the flowering stem.

Comments: a relatively uncommon, moderately shade-tolerant herb that is characteristic of: i) Mors and Moders; and ii) submontane to sub-alpine ecosystems.

Herb

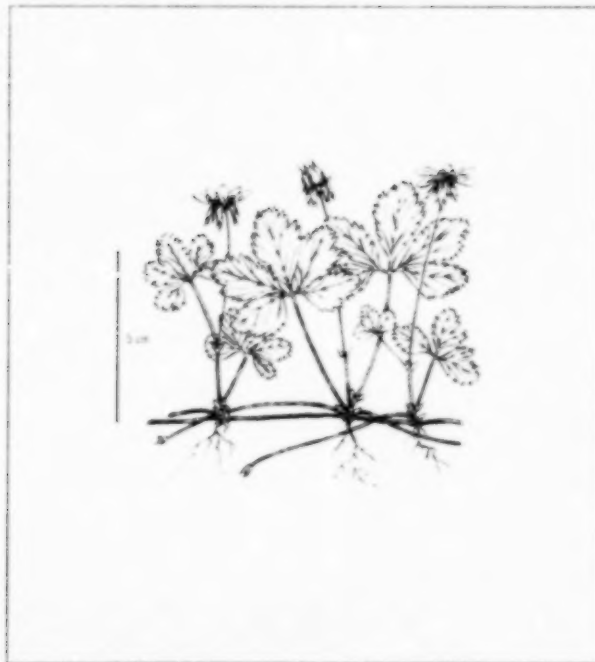
Rubus pedatus

Five-leaved bramble

EISG No. 1.5

Fresh to moist

Nutrient-very poor
to medium



General: perennial with creeping stem, produces short erect stems with 1-3 leaves and single flowers.

Leaves: 5 - (3) leaflets, coarsely serrated.

Flowers: single flower per stem, petals white and large.

Fruit: small, red, raspberry shaped.

Comments: a common, shade tolerant, evergreen semi shrub that is characteristic of: i) the montane wetter CWH and lower MH and ESSF, ii) Mors; and iii) Hw, Hm, and Se ecosystems of medium (high) productivity. On nutrient richer sites it may grow on decaying wood.

NB: this evergreen semi shrub is included in the herb group because of its similar form

APPENDIX II

Herb

Smilacina racemosa

False Solomon's-seal

EISG No. 34

Dry to moist

Nutrient medium
to very rich



General stems erect to stiffly arching, unbranched, 0.3 – 1 m tall

Leaves: oval, narrows at the base where it attaches to the stem

Flowers: very numerous, small, white, in a cluster on a flowering stem at the tip of the plant.

Fruit: reddish berries.

Comments: a common, moderately shade tolerant herb that is characteristic of i) the CDF, CWH, and IDF (its abundance increases from west to east through the Region); and ii) Moders and Mulls

N.B. may be confused with *S. stellata*.

APPENDIX II (Page 330)

Herb

Smilacina stellata

Star-flowered false Solomon's seal

EISG No. 3.4

Dry to moist

Nutrient-medium
to very rich



General: single stem, erect or arching, 20 – 60 cm tall.

Leaves: long, narrow, maybe slightly rounded at base or tapering towards stem (a).

Flowers: few, creamy white, on a short flowering stalk at the tip of the plant (b).

Fruit: greenish-yellow berry darkening with age.

Comments: a common, shade-tolerant herb that is characteristic of: i) Moders and Mulls; and ii) submontane to subalpine ecosystems of medium to high productivity.

N.B. may be confused with *S. racemosa* and *Streptopus roseus*.

APPENDIX II (cont'd 37)

Herb

Streptopus amplexifolius

Clasping twistedstalk

EISG No. 3.5

Fresh to moist

Nutrient-medium
to very rich



General: stems branched, 0.4 – 1 m tall.

Leaves: oval, tapering towards tip, clasping stem (a).

Flowers: usually single (sometimes a pair), white with a greenish tinge on a twisted stalk (b), arising from axils (between leaf and stem) anywhere along the stem.

Fruit: yellow to red berry.

Comments: a common, shade-tolerant herb that is characteristic of: i) the montane wetter CWH and lower MH and ESSF; ii) friable Mors and Moders; and iii) ecosystems of high productivity.

N.B. may be confused with *Disporum* spp. and *S. roseus*.

APPENDIX II (cont'd 38)

Herb

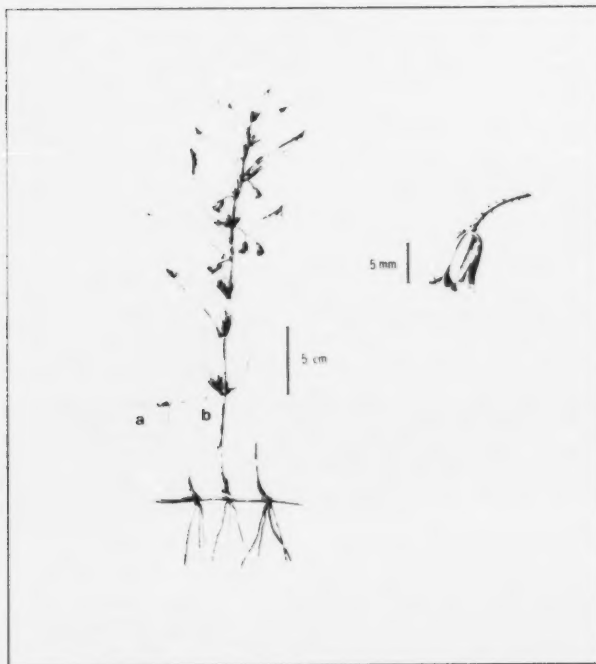
Streptopus roseus

Rosy twistedstalk

EISG No. 3.5

Fresh to moist

Nutrient-medium
to very rich



General: single stems erect-arching, 30 – 80 cm tall.

Leaves: base partially clasps stem (a), oval-shaped, slightly hairy at base where attached to stem (b).

Flowers: single, rose coloured, arising from axils (between leaf and stem) anywhere along the stem, stalk not twisted.

Fruit: red berry.

Comments: a common, shade-tolerant herb that is characteristic of: i) the montane wetter CWH and lower MH and ESSF; ii) friable Morc and Moders (rarely Mulls); and iii) ecosystems of medium to high productivity (typically seepage sites).

N.B. may be confused with *S. amplexifolius*, and *Smilacina stellata*.

APPENDIX II (cont'd 39)

Herb

Tiarella laciniata

Cut-leaved foamflower

EISG No. 3.5

Fresh to moist

Nutrient-medium
to very rich



General: stems horizontal to erect.

Leaves: basal, 3 leaflets, lower leaflets deeply lobed almost to the base, upper leaflet also lobed and serrated (a).

Flowers: white, elongated cluster along a flower stem.

Comments: a common, shade-tolerant herb that is characteristic of: i) the CDF and CWH; ii) Moders and Muls; and iii) Bg, Cw, and Fd ecosystems of medium-high productivity (typically seepage sites).

N.B. very similar to *T. trifoliata* except leaflets deeply lobed.

Appendix II (cont d 40)

Herb

Tiarella trifoliata

Three-leaved foamflower

EISG No. 3.5

Fresh to moist

Nutrient-medium
to very rich



General: horizontal to erect.

Leaves: basal, 3 leaflets per leaf, leaflets lobed not more than half their length and serrated (a).

Flowers: white, elongated cluster along flower stem.

Comments: a common, shade-tolerant herb that is characteristic of: i) the IDF, CDF and CWH; ii) Moders and Mulls; and iii) Bg, Cw, and Fd eco-systems of medium-high productivity (typically seepage sites).

APPENDIX II (cont'd 41)

Herb

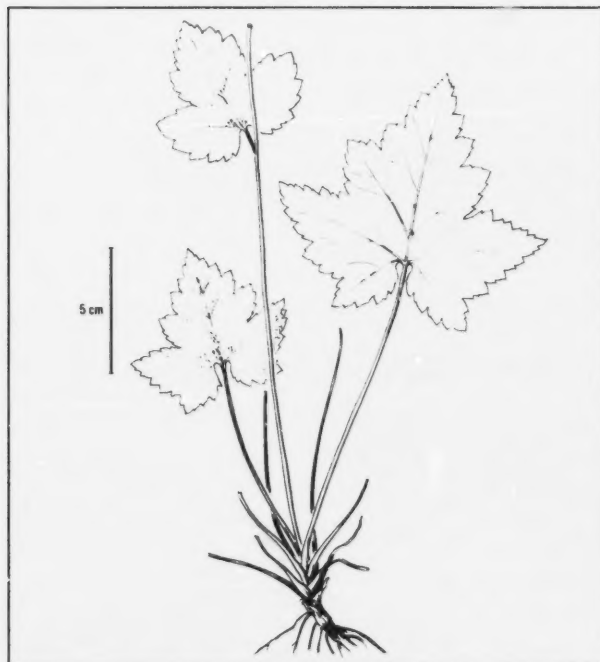
Tiarella unifoliata

One-leaved foamflower

EISG No. 2.3

Dry to moist

Nutrient-medium



General: horizontal to erect.

Leaves: no leaflets (leaves entire), 3 to 5-lobed.

Flowers: white, elongated cluster along a flower stem (similar to *T. trifoliata*).

Comments: a common, shade-tolerant herb that is characteristic of: i) the wetter IDF, submaritime CWH, lower MH and ESSF; ii) Mors and Moders (occasionally Mulls); and iii) medium to high productivity ecosystems.

Appendix II (cont'd 42)

Herb

Veratrum viride

Indian hellabore

EISG No. 3.6

Moist to wet

Nutrient-medium
to very rich



General: stems erect, 1 – 2 m tall, unbranched, robust.

Leaves: large, broad, partially clasping, strongly veined.

Flowers: numerous, yellowish-green on a many-branched flowering stem, flowering branches droop.

Comments: a conspicuous, common, moderately shade-tolerant herb that is characteristic of: i) the montane wetter CWH, MH, and ESSF; ii) gleysolic or organic soils, featuring a high groundwater table or seepage, iii) saturated Moders and Molls; and iv) ecosystems of poor to medium productivity.

Fern

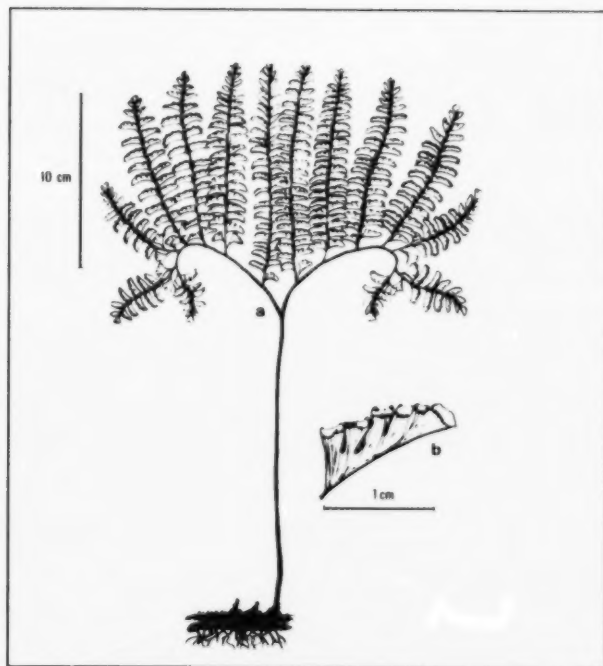
Adiantum pedatum

Maidenhair fern

EISG No. 3.6

Moist to wet

Nutrient-medium
to very rich



General: deciduous, erect, 30 – 60 cm (1 m) tall, fan-shaped appearance, stems black to dark reddish-brown and shiny, forking at the top (a) with each branch arching upward then curving downward.

Leaves: leaflets (b) are lobed, triangular in outline and fold upward from the midrib.

Comments: a common, shade-tolerant fern that is characteristic of: i) Moders and Mulls; ii) seepage sites; and iii) submontane to montane Ba, Bg, Cw, Fd and Pw ecosystems of high productivity.

Fern

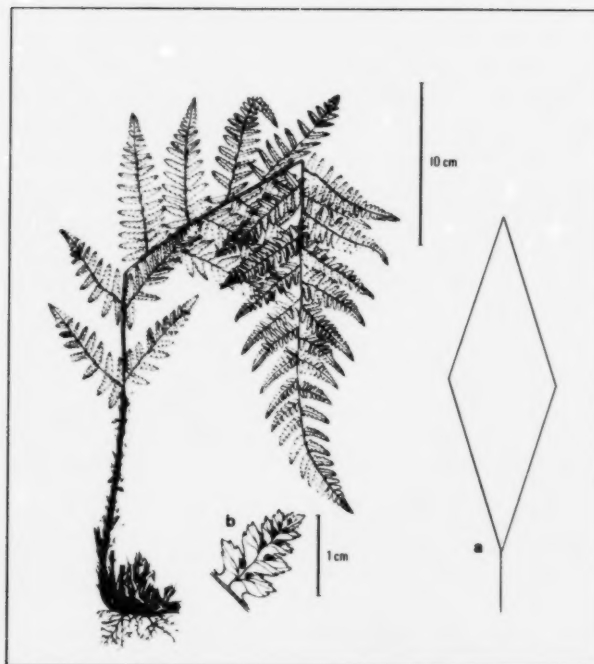
Athyrium filix-femina

Lady fern

EISG No. 3.6

Moist to wet

Nutrient-medium
to very rich



General: deciduous, erect-arching, spreading from plant center, 0.6 – 1.5 m (2 m) tall, stems straw coloured, branches widest at mid-stem, tapering towards base and tip giving a diamond shaped outline (a).

Leaves: leaflets are lobed and serrated (b).

Comments: a common, moderately shade-tolerant fern that is characteristic of: i) Moders and Mulls (and their saturated forms); ii) seepage, floodplain and stream-edge sites featuring soils rich in organic matter; and iii) submontane to subalpine, Ba, Bg, Cw, and Fd ecosystems of medium to high productivity.

N.B. may be confused with *Dryopteris expansa*.

Fern

Blechnum spicant

Deer fern

EISG No. 1.6

Moist to wet

Nutrient-very poor
to medium



General: non-reproductive leaves evergreen, numerous, erect-arching and spreading from plant center (a), reproductive leaves deciduous, less numerous and arising erect (up to 1m tall) from plant center (b).

Leaves: leaflets leathery, dark green, attached to stem without a stalk (c).

Comments: a common, shade-tolerant fern that is characteristic of: i) the maritime CWH and MH (its abundance decreases from west to east through the Region); ii) Mors grading towards Moders (and their saturated forms); and iii) Ba, Cw, Hm, Hw, and Yc ecosystems of medium to high productivity.

Fern

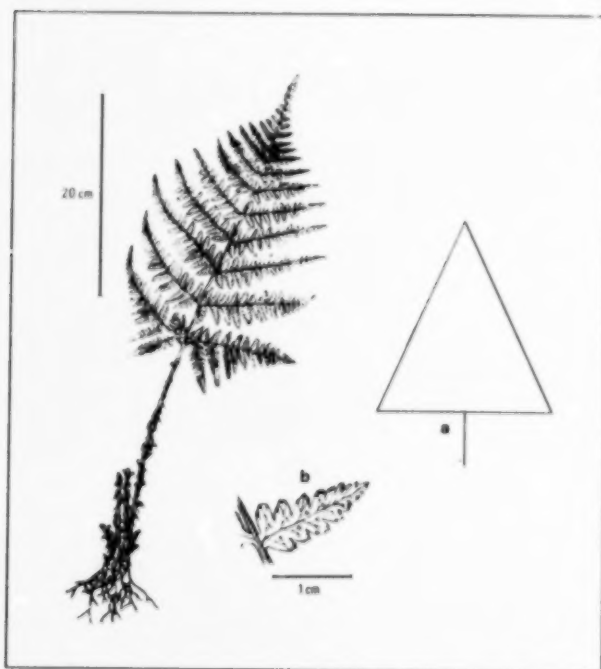
Dryopteris expansa

Spiny wood fern

EISG No. 1.5

Fresh to moist

Nutrient-very poor
to medium



General: deciduous, erect-arching, spreading from plant center, 0.3 - 1m tall, branching starts 1/3 to 1/2 way up the stem, longest branches near the bottom and the shortest at the top (triangular shaped outline (a)), on the bottom branch lower leaflets are at least twice as long as those above.

Leaves: leaflets lobed, serrated, with finely pointed spines (b).

Comments: a common, shade-tolerant fern that is characteristic of: i) Mors, grading towards Moders; and ii) submontane to subalpine, Ba, Hm, Hw, and Yc ecosystems of medium to high productivity. On nutrient-rich sites, it typically grows on decaying wood.

N.B. may be confused with *Athyrium filix-femina*.

Fern

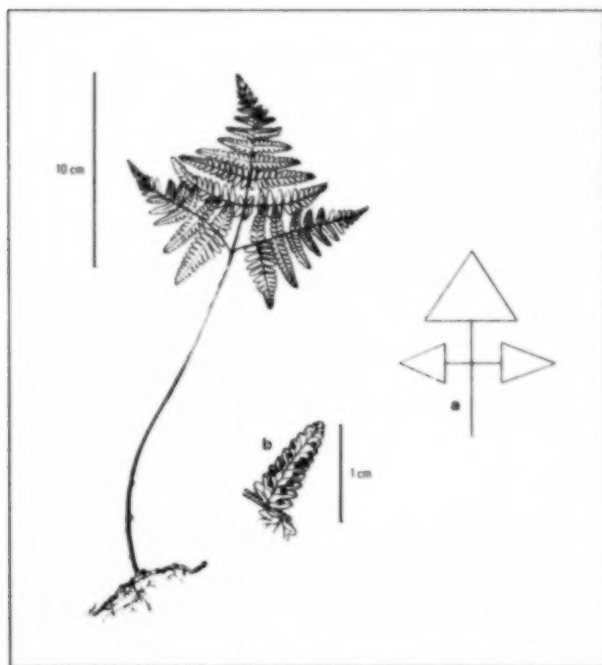
Gymnocarpium dryopteris

Oak fern

EISG No. 3.5

Fresh to moist

Nutrient-medium
to very rich



General: deciduous, erect up to 40 cm tall, stem has three groups of leaflets representing three triangles (a).

Leaves: leaflets lobed (b).

Comments: a common, shade-tolerant fern that is characteristic of: i) sub-maritime biogeoclimatic units (its abundance increases, replacing *Polystichum munitum*, from west to east through the Region); ii) Moders and Muls; iii) seepage, floodplain and stream-edge sites; and iv) ecosystems of high productivity.

Appendix II (cont'd 48)

Fern

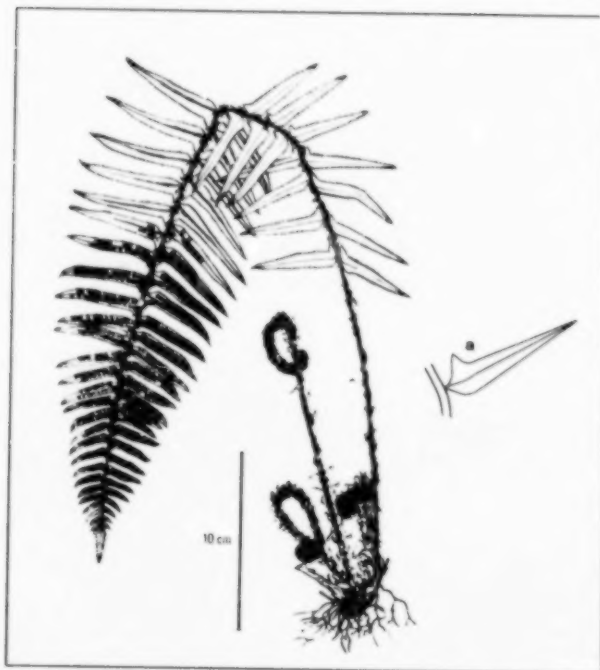
Polystichum munitum

Sword fern

EISG No. 3.4

Dry to moist

Nutrient-medium
to very rich



General: evergreen, erect-arching, spreading from plant center, up to 1.5 m tall, stem straw-coloured with flaking scales, unbranched.

Leaves: leaflets leathery, long and narrow, sharp-pointed, serrated, large tooth at base (a), attached to the stem by a small, short stalk.

Comments: a common, shade-tolerant fern that is characteristic of: i) the maritime CDF and CWH (its abundance decreases from west to east through the Region); ii) Moders and Mulls; iii) soil rich in organic matter; and iv) ecosystems of medium to high productivity.

Fern

Pteridium aquilinum

Bracken

EISG No. 3.3

Dry to fresh

Nutrient-medium
to very rich



General: deciduous, erect-arching, up to 2.5 m tall, stem light green, many alternate branches.

Leaves: leaflets attached directly to small branches without stalk, edges smooth and rolled (a).

Comments: a common, moderately shade-tolerant fern that is characteristic of: i) Moders, grading towards Mors or Muls; and ii) submontane, seral ecosystems. Often a vigorously competing species on disturbed sites.

Lichen

Very dry

***Cladonia* and *Cladina* spp.**

Nutrient-very poor
to poor

Lichens



General: several species varying in composition from many fine to coarse, hollow, upright, branched structures or club-like stalks, colours vary widely, most commonly ashy white to grey or light green.

Comments: lichens (genera *Cladina* and *Cladonia*) are moderately shade-tolerant to shade-intolerant. They are characteristic of: i) dry crust-like Mors or Moders; and ii) non-forested or sparsely forested ecosystems of low productivity (e.g. rock outcrops). On wetter or nutrient-richer sites they may grow on decaying wood or organic mounds which are frequently desiccated.

Moss

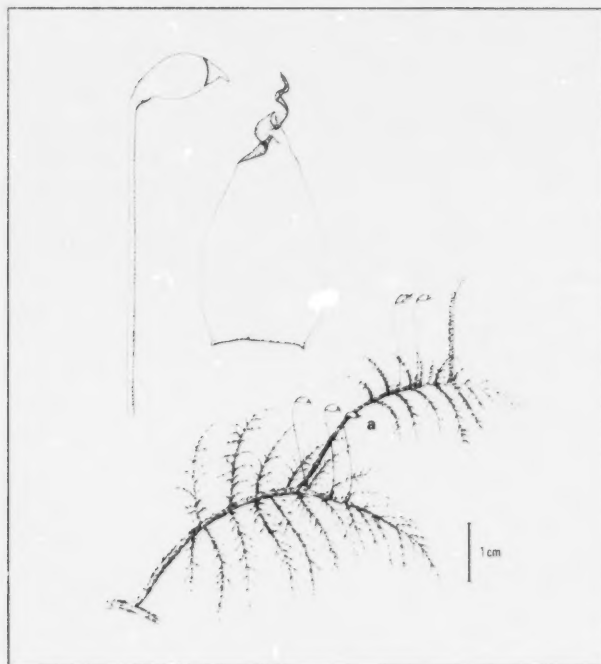
Hylocomium splendens

Step moss

EISG No. 1.4

Dry to moist

Nutrient-very poor
to medium



General: current year's growth arches from the middle of previous year's growth (a) giving a step-like appearance, forms soft mats, stems are red, colours range from dull yellow to brownish-green, with a satiny gloss.

Comments: a common, shade-tolerant moss that is characteristic of Moss in submontane to subalpine ecosystems. On nutrient richer sites it grows on decaying wood.

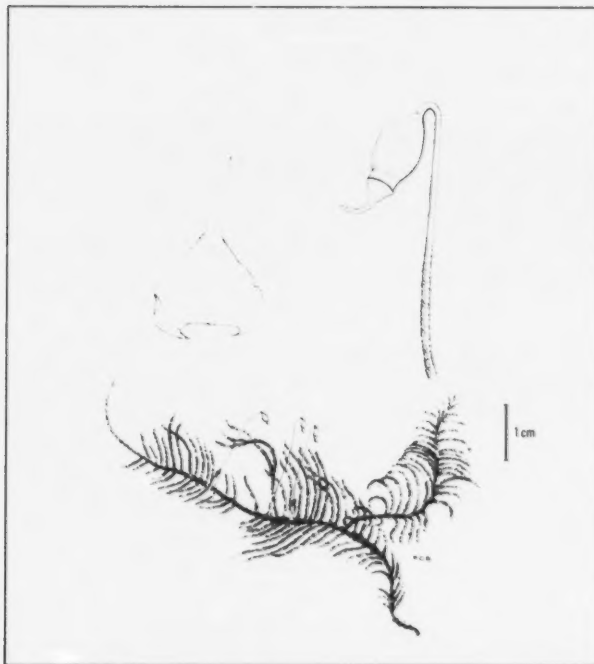
Appendix II (continued 52)

Moss

Kindbergia oregana

EISG No. 2.2

Dry to fresh
Nutrient-medium



General: creeping form, branched, forming interwoven mats, stems are green, colours range from yellowish-green to dark green, the younger shoots often pale green.

Comments: a common, shade-tolerant moss that is characteristic of: i) the CDF and maritime CWH (its abundance decreases from west to east through the Region); ii) thin, friable Mors and Moders; and iii) Fd ecosystems of medium productivity. On wetter or nutrient-rich sites it may grow on tree boles (epiphyte).

Appendix II (cont'd 53)

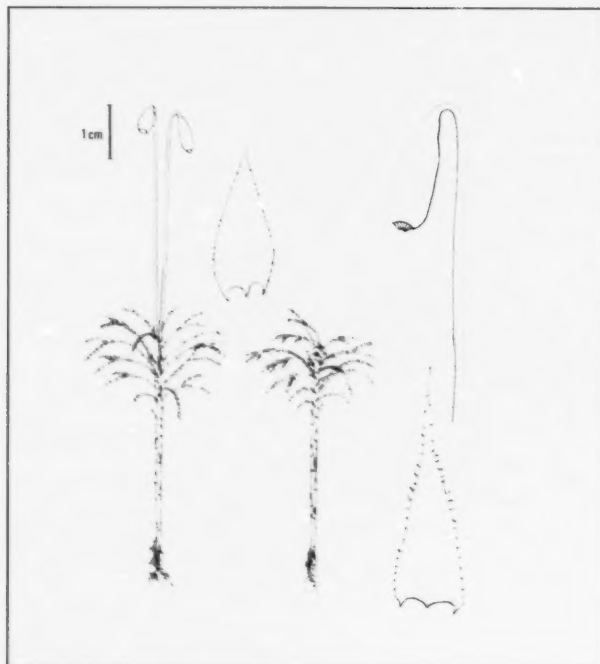
Moss

Leucolepis menziesii

EISG No. 3.6

Moist to wet

Nutrient-medium
to very rich



General: resembles tiny erect trees (2-5 cm tall) with a rounded tuft of branches on the upper portion of the stem, lower portion of stem bare except for small scales, stem dark reddish-brown to nearly black, colours range from dark green to light green.

Comments: a common, shade-tolerant moss that is characteristic of: i) the maritime CDF and CWH (its abundance decreases from west to east through the Region); ii) Moders and Mulls, usually on soil rich in organic matter; iii) seepage, floodplain, and stream-edge sites; and iv) Ba, Cw and Fd ecosystems of high productivity.

Appendix II (cont'd 54)

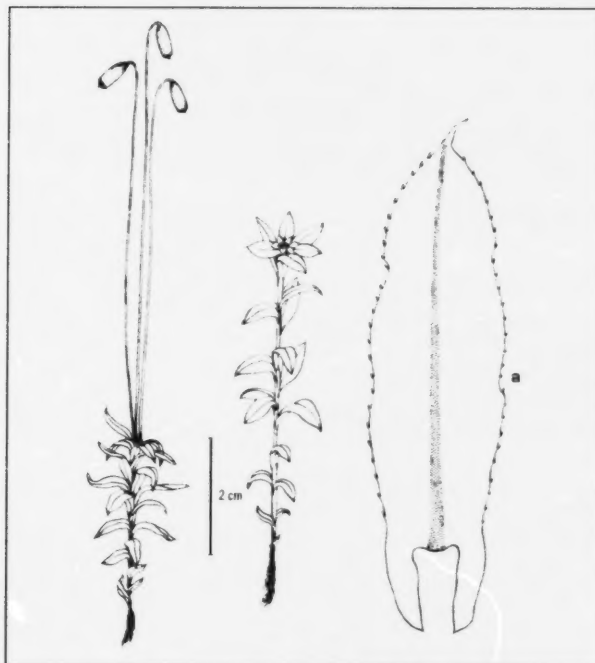
Moss

Plagiomnium insigne

EISG No. 3.6

Moist to wet

Nutrient-medium
to very rich



General: dark green to pale green, semi-transparent leaves with serrated edges (a) along the entire leaf (can be seen with the naked eye), leaf width is constant, leaves contorted when dry, stems are erect in reproductive plants, with a rosette of leaves or capsules at tip, stems may be arched in non-reproductive plants.

Comments: a common, shade-tolerant moss that is characteristic of: i) the CDF and CWH; ii) Muls and Moders, often on soil rich in organic matter; iii) seepage, floodplain and stream-edge sites; and iv) Ba, Bg, Cw and Fd ecosystems of high productivity.

Appendix II (cont'd 55)

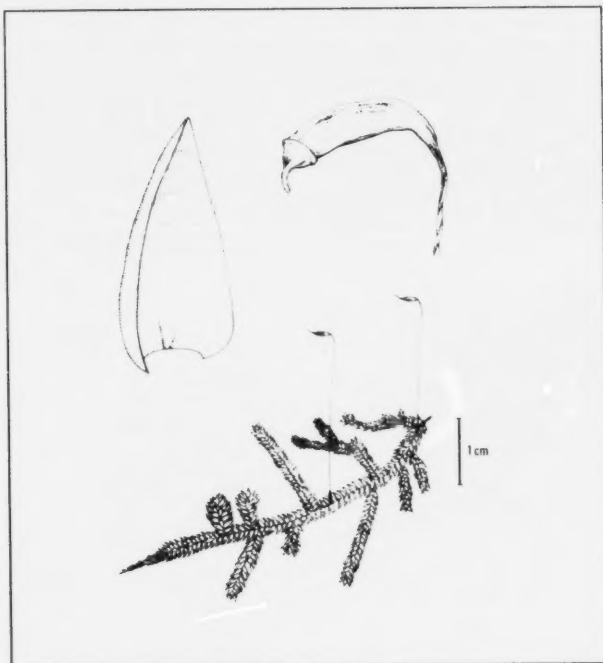
Moss

Plagiothecium undulatum

EISG No. 1.5

Fresh to moist

Nutrient-very poor
to medium



General: unevenly branched, forms creeping mats, leaves overlap in one plane along pale green stems giving a flat appearance, majority of leaves are of similar size and tend to point towards branch tip, glossy pale green colour.

Comments: a common, shade-tolerant moss that is characteristic of: i) the maritime CWH (its abundance decreases from west to east through the Region); and ii) Mors which often contain abundant decaying wood. On nutrient-richer sites it typically grows on decaying wood.

N.B. may be confused with *Rhytidiopsis robusta*.

Moss

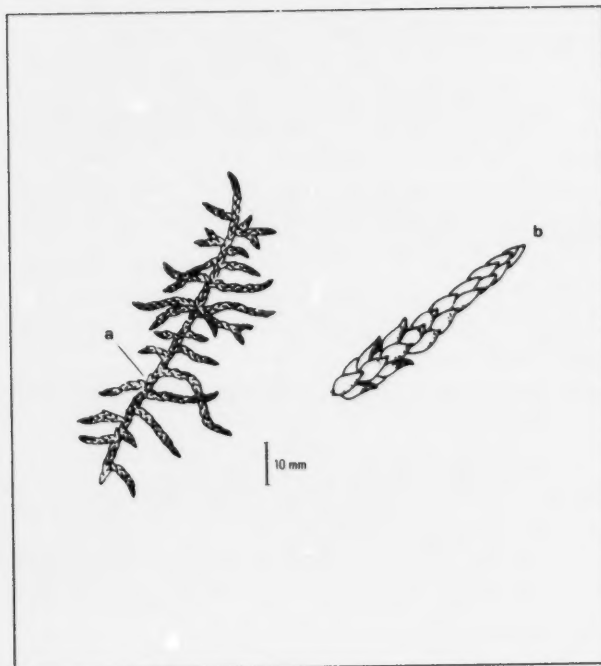
Pleurozium schreberi

Red-stemmed feather moss

EISG No. 1.3

Dry to fresh

Nutrient-very poor
to medium



General: forms thick mats, stems red, visible through leaves (a), leaves overlapping around stem and branches, branch tips distinctly pointed (b), colour ranges from glossy yellow to pale green.

Comments: a common, moderately shade-tolerant moss that is characteristic of:
i) subarctic to continental biogeoclimatic units (its abundance increases from west to east through the Region); ii) Mors; and iii) open-canopy Fd and Pl ecosystems of low to poor productivity. On wetter or nutrient-richer sites it grows on organic mounds which are frequently desiccated.

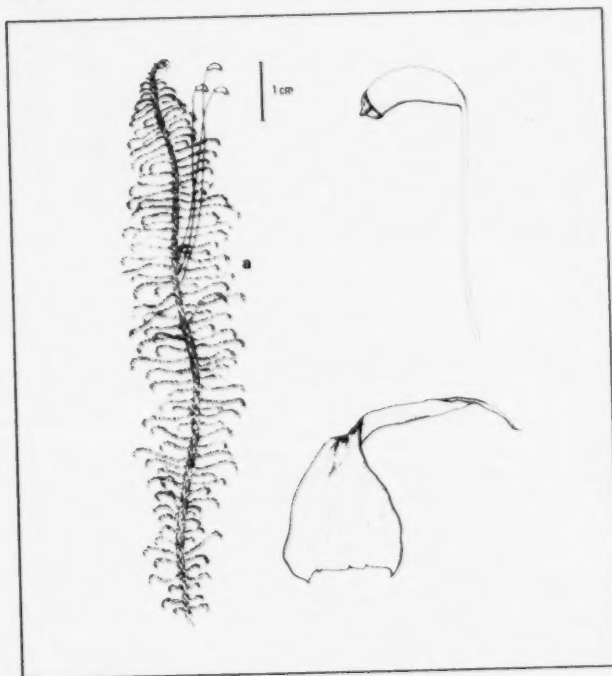
Moss

Dry to moist

Ptilium crista-castrensis

Nutrient-very poor
to medium

Knight's plume moss



General: feather-like appearance, forms soft mats, branching evenly, all in one plane, leaves curled downwards at branch tips (a), stems yellowish to pale green, colour ranges from green to yellow.

Comments: a common, shade-tolerant moss that is characteristic of: i) sub-maritime to continental biogeoclimatic units (its abundance increases from west to east through the Region); and ii) Mors. On wetter or nutrient-rich sites it grows on decaying wood.

Appendix II (cont d 58)

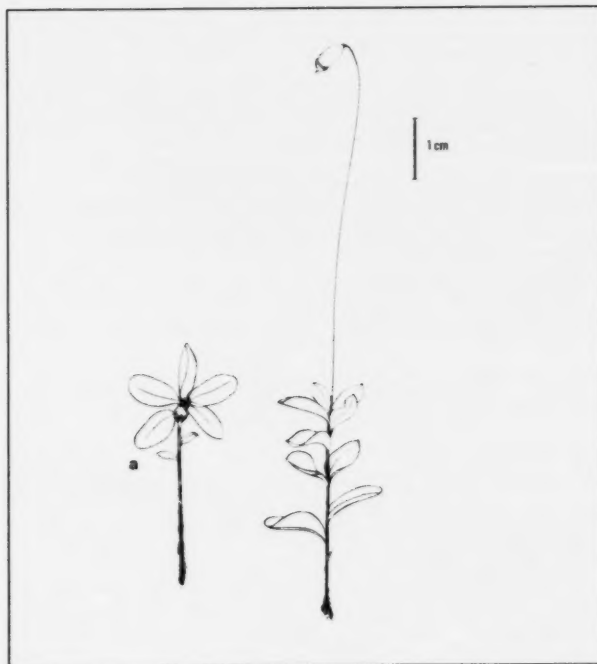
Moss

Rhizomnium glabrescens

EISG No. 2.4

Fresh to moist

Nutrient-medium



Général: dark green, semi-transparent leaves with smooth edges (a), leaf is oval-shaped, stems are unbranched and erect, occasionally reclining, a cluster of leaves at tip.

Comments: a common, very shade-tolerant moss that is characteristic of: i) the CWH (its abundance decreases from west to east through the Region); ii) Mors (and their saturated forms); and iii) Hw eco-systems of high productivity. It often grows on decaying wood.

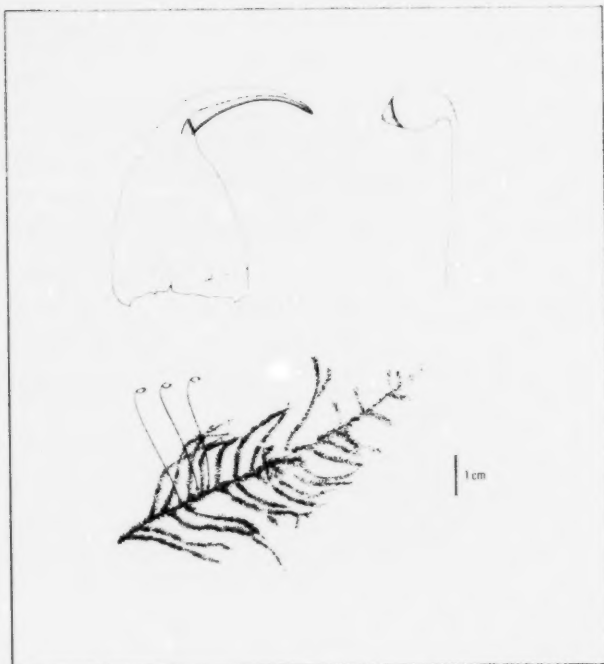
Moss

Rhytidiadelphus loreus

EISG No. 1.5

Fresh to moist

Nutrient-very poor
to medium



General: forms creeping mats, branch tips pointed or blunt, leaves often curl outward from stem, stems reddish-brown, colour ranges from light green to yellowish green with a glossy sheen.

Comments: a common, shade-tolerant moss that is characteristic of: i) the maritime CWH (its abundance decreases from west to east through the Region); ii) Mors; and iii) low ecosystems of medium to high productivity. On nutrient-rich sites it typically grows on decaying wood.

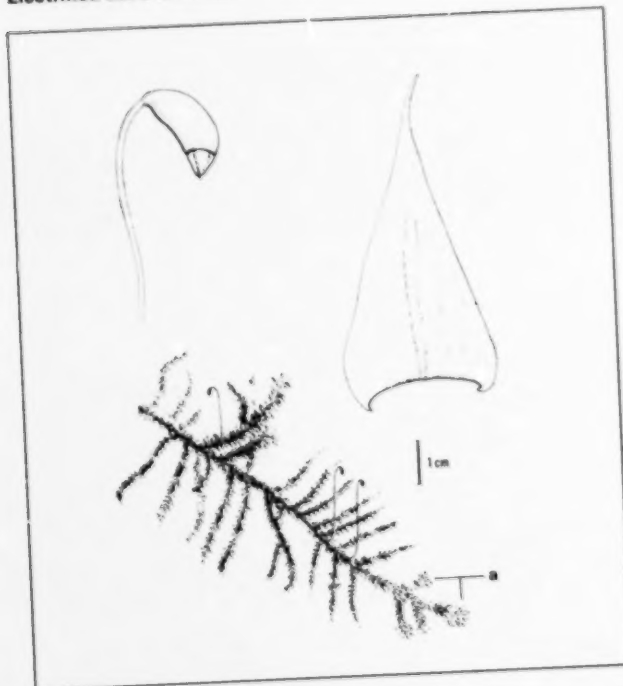
Moss

Dry to fresh

Rhytidiadelphus triquetrus

Nutrient-medium
to very rich

Electrified cat's tail moss



General:

forms creeping mats, main branch tips have tufts of leaves (a), leaves often curl outward from stem, stems are reddish-brown, colour ranges from pale green to yellowish-green.

Comments:

a common, moderately shade-tolerant moss that is characteristic of: i) the IDF, CDF and drier CWH (its abundance increases from west to east through the Region); ii) Moders grading towards Mors; and iii) Fd ecosystems of medium to poor productivity. On wetter sites it often grows on tree boles (epiphyte).

Appendix II (cont d 61)

EISG No. 1.4

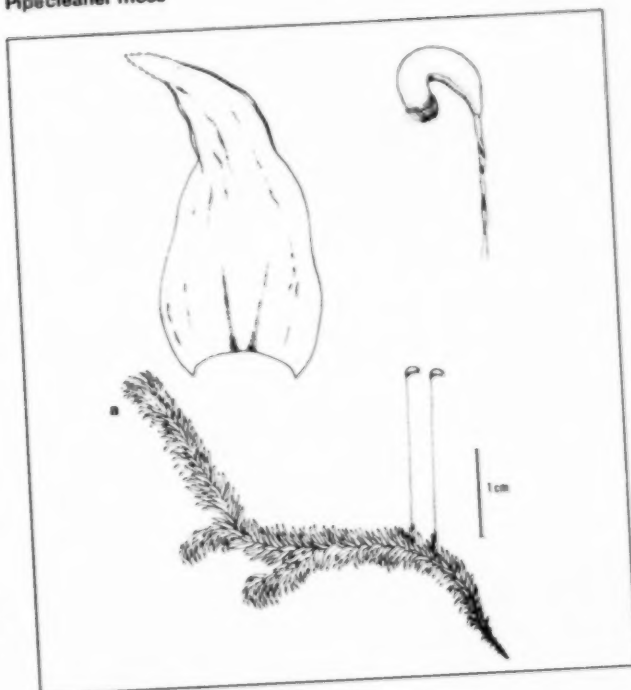
Moss

Dry to moist

Rhytidiopsis robusta

Nutrient-very poor
to medium

Pipcleaner moss



General: creeping stems, forms mats, sparsely branched, overlapping leaves curved outward along stem and downward at branch tips (a), stems yellowish-green to pale green.

Comments: a common, moderately shade-tolerant moss that is characteristic of: i) the MH, ESSF and montane wetter CWH and IDF; ii) Mors; and iii) ecosystems of poor to medium productivity. On nutrient-rich sites it grows on decaying wood.

N.B. may be confused with *Plagiothecium undulatum*.

Moss

***Spagnum* spp.**

EISG No. 1.7

Wet

Nutrient: very poor
to medium



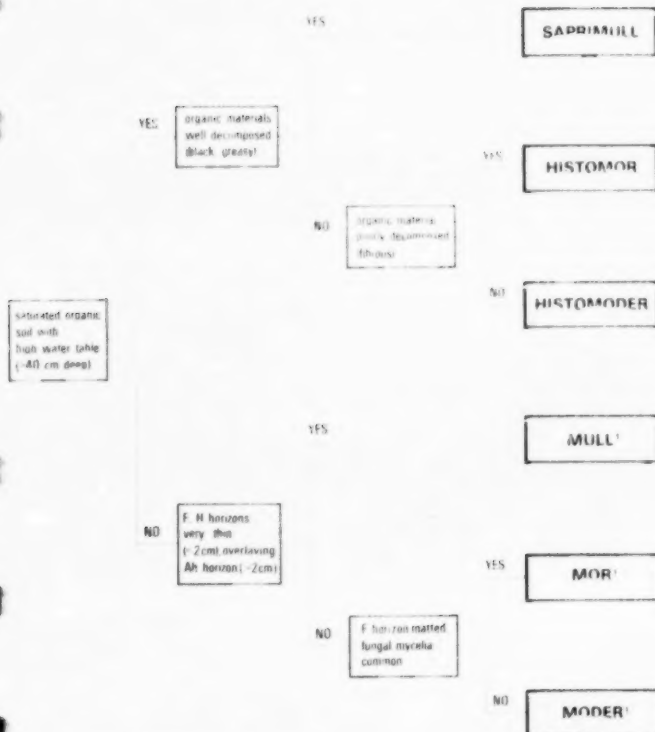
General: usually erect, forms tufts, mats or hummocks, branches in clusters of 2 - 5 (a) along the main stem, terminal branches in a tight tuft (b), colours vary with species, commonly light green to reddish-green.

Comments: common, moderately shade-tolerant to shade-intolerant moss species that are characteristic of: i) saturated poorly-aerated Murs on organic soil (peat bogs), and ii) waterlogged, non-forested or sparsely forested PI ecosystem of low productivity.

N.B. *Spagnum grayiournii* may be found growing in clumps within moist coastal forests.

APPENDIX III

Key to identification of humus forms



¹ Prefix with 'hydro' if humus form wet.

APPENDIX IV

Key for estimating soil texture in the field (part 1; from B.C. Ministry of Forests, information leaflet FS 238)

Soil texture is the relative proportion of various size fractions of a soil.

Coarse fragments consist of particles greater than 2 mm in diameter. They are estimated visually as a percentage of the whole soil.
 $\% \text{ stones} + \% \text{ rut tiles} + \% \text{ gravels} + \% \text{ fine fraction} = 100\%$ (Total soil)

The **fine fraction** consists of particles less than 2 mm in diameter (for non-spherical particles see accompanying figure).
 $\% \text{ sand} + \% \text{ silt} + \% \text{ clay} = 100\%$ (Fine fraction)

Particles of the two size fractions are defined on the accompanying figure.

The **relative proportion of fine fraction** particles (**sand**, **silt** and **clay**) are estimated through the use of their unique properties of feel. **Sand** can always be felt as individual **grains** that silt and clay generally cannot. Dry **silt** feels floury and wet silt is **slippery** but not sticky. Dry **clay** forms hard lumps, is very sticky when wet and plastic (like plasticene) when moist.

Most soils are a mixture of sand, silt and clay, so the graininess, slipperiness or stickiness will vary depending upon how much of each particle size is present. As the amount of clay increases, soil particles bind together better, form stronger casts, and longer, stronger worms. As sand and silt increase the soil binding strength decreases, and only weak to moderately strong casts and worms can be formed. The various classes of soil texture defined on the **textural triangle** in the accompanying figure are named by a combination of the dominant particle size, the term **loam** meaning a relatively even mix of the three.

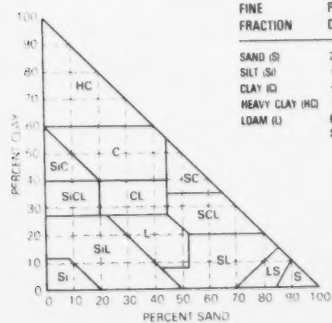
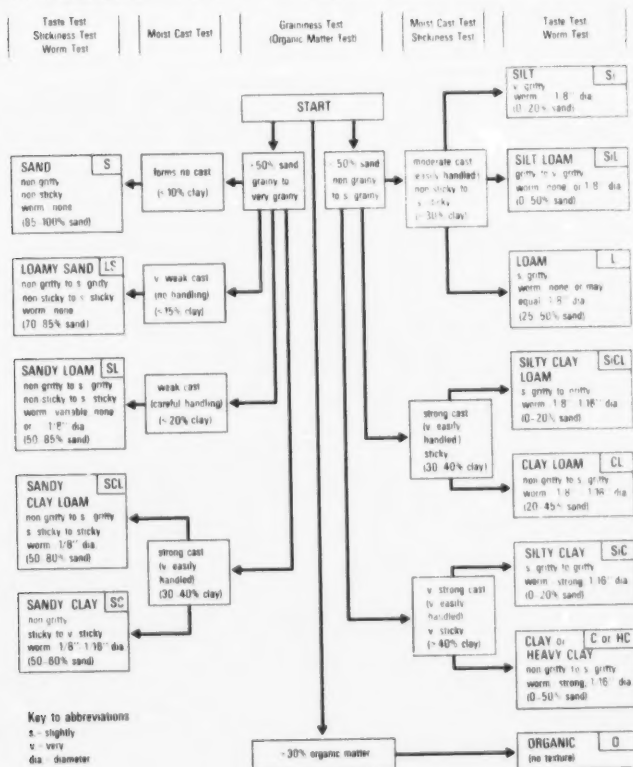
The field determination of soil texture is subjective and can only be done consistently with training and experience. The field tests outlined below and used in sequence with the accompanying flow chart are provided to assist in the field determination of soil texture.

1. **Graininess Test:** Rub the soil between your fingers; if sand is present, it will feel "grainy". Determine whether sand comprises more or less than 50% of the sample.
2. **Moist Cast Test:** Compress some moist soil by clenching it in your hand. If the soil holds together (i.e. forms a "cast"), then test the durability of the cast by tossing it from hand to hand. The more durable it is, the more clay is present.
3. **Stickiness Test:** Wet the soil thoroughly and compress between thumb and forefinger. Degree of stickiness is determined by noting how strongly the soil adheres to the thumb and forefinger upon the release of pressure, and how much it stretches. Stickiness increases with clay content.
4. **Worm Test:** Roll some moist soil between the palms of your hands to form the longest, thinnest worm possible. The more clay there is in the soil, the longer, thinner and more durable the worm will be.
5. **Taste Test:** Work a small amount of soil between your front teeth. Silt particles are distinguished as fine "grittiness", unlike sand which is distinguished as individual grains (i.e. "graininess"). Clay has absolutely no "grittiness" at all.

Well decomposed **organic matter** (humus) imparts silt like properties to the soil. It feels floury when dry and slippery when moist, but **not** sticky and **not** plastic. However, when subjected to the taste test, it feels non-gritty. It is generally very dark when moist or wet, and stains the hands brown or black. Humus-enriched soils often occur on wet sites in association with a heavy moss cover, and on grasslands. Humus is **not** used as a determinant of soil texture; estimate of the silt content of any humus-enriched mineral soil should be reduced accordingly.

"Organic" soil samples are those that contain more than 30% organic matter. Soil texture is **not** determined on organic samples. Most organic soils and deep organic horizons are found on wet sites, often in depressions or on floodplains, also in association with a dense moss cover (frequently *Sphagnum* spp.).

APPENDIX IV Key for estimating soil texture in the field (part 2)



FINE FRACTION	PARTICLE DIAMETER
SAND (S)	2.0mm
SILT (Si)	0.002mm
CLAY (C)	< 0.002mm
HEAVY CLAY (HC)	> 0.002mm
LOAM (L)	MIX OF SAND, SILT & CLAY

COARSE FRAGMENTS	PARTICLE DIAMETER
STONES	250mm
COBBLES	25.0-75mm
GRAVELS	75-2mm

PRINCIPAL AXES OF A COARSE FRAGMENT



coarse fragment size is always determined along the b-axis

APPENDIX V

Key to the identification of potential hygrotope (part 1)

This key was devised to aid field staff in the Vancouver Forest Region in the identification of potential hygrotope using readily observable environmental features. It should be applied with caution on ridge crests, upper slopes and middle slopes which have soils characterized by thick (>20 cm) accumulations of organic materials. In such cases, the potential hygrotope will generally be higher than indicated.

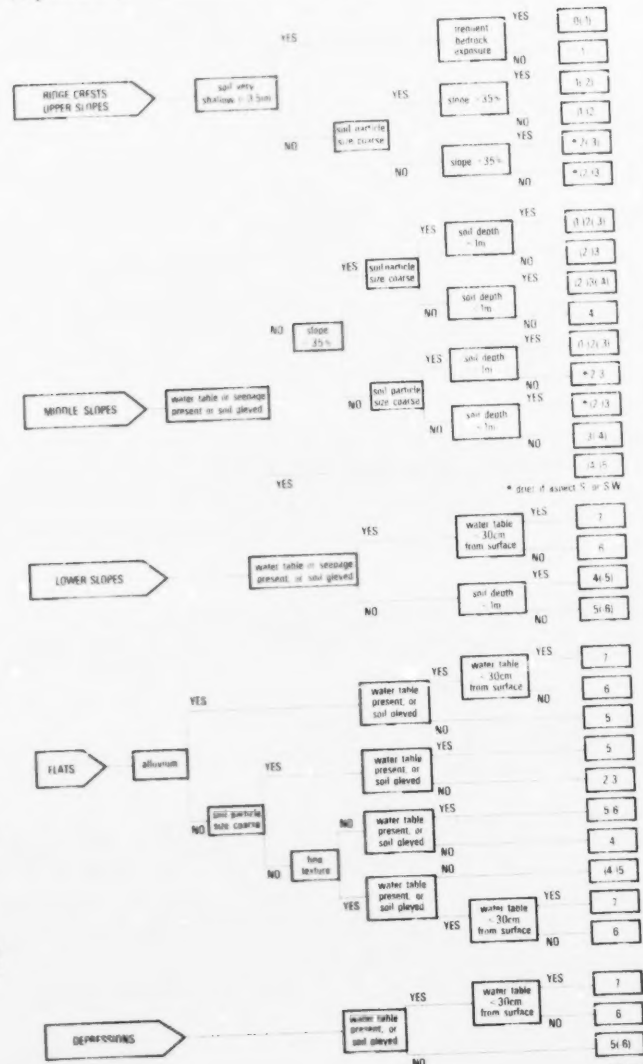
Category	Definition
Ridge crest	height of land, usually convex slope shape
Upper slope	the generally convex shaped, upper portion of a slope
Middle slope	the portion of a slope between the upper and lower slopes; the slope shape is usually straight
Lower slope	the area towards the base of a slope; the slope shape is usually concave. It includes toe slopes which are generally level areas located directly below and adjacent to the lower slope
Flat	any level area (excluding toe slopes); the surface shape is generally horizontal with no significant aspect
Alluvium	most glacial active floodplain deposits along rivers and streams in valley bottoms, usually a series of low benches and channels
Depression	any area that is concave in all directions; usually at the foot of a slope or in flat topography
Soil depth	depth from the mineral soil surface to a restricting layer such as bedrock, strongly compacted, or strongly cemented materials (e.g. hardpan).
Gleyed	soils that have orange coloured mottles indicative of a fluctuating water table. Permanently gleyed soils are dull yellowish blue, or olive in colour.
Soil particle size coarse	sandy ¹ with >35% volume of coarse fragments, or loamy ¹ with >70% volume of coarse fragments
Fine texture	silty ¹ or clayey ¹ with low coarse fragment volume

¹ Sandy - LS, S; loamy - SL, L, SCL; clayey - SiCL, CL, SC, SiC, C; silty - SiL, Si

APPENDIX V

Key to the identification of potential hygrotopes (part 2)

Key to the identification of potential hygrotome (part 2)



APPENDIX VI Key to the identification of trophotope (part 1)

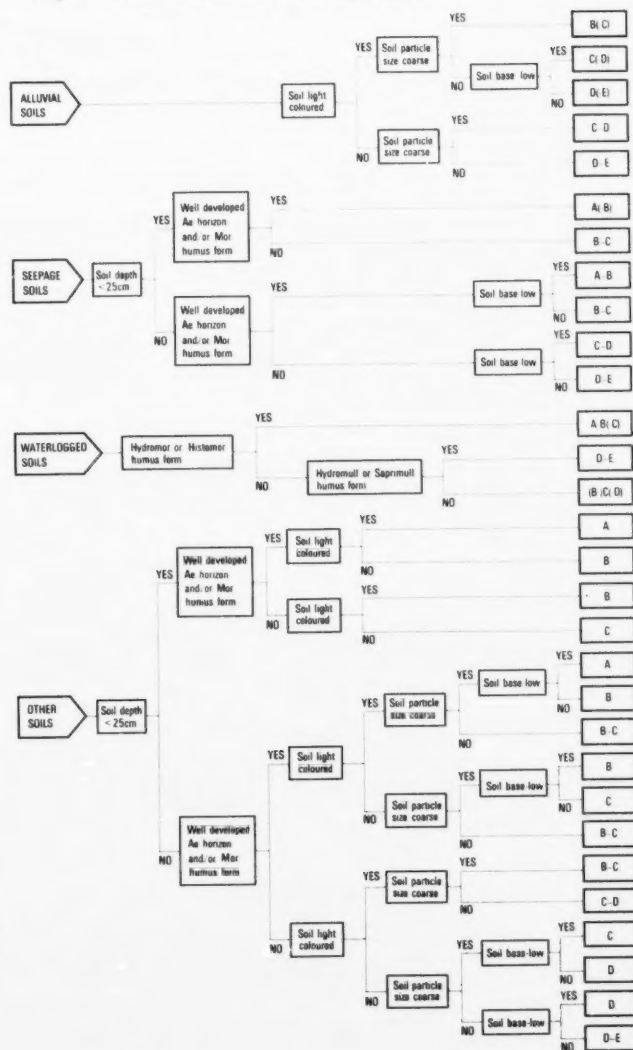
This key was devised to aid field staff in the Vancouver Forest Region in the identification of trophotope using readily observable environmental and soil properties. It is intended to be used in conjunction with indicator plant analysis. It should be assessed on the basis of soil examinations to a depth of at least 30 cm (from the top of the mineral soil) in several locations on the site.

Category	Definition
Alluvial soils	soils that are found on active floodplains; inactive floodplains (e.g., those on higher terraces) should be considered under other soils. Alluvial soils feature (a) fluctuating or moving water table at a depth > 30 cm (or overland flow during flooding), and (b) deposition of materials carried by water.
Seepage soils	soils that feature permanent or temporary moving groundwater within the rooting zone during the growing season (may be indicated by mottled horizons).
Waterlogged soils	organic or gleysolic soils that feature a temporary or permanent water table < 30 cm (rarely < 50 cm) from the ground surface. They are typically found on flats or in depressions.
Ae horizon	a leached horizon in the upper soil profile characterized by a greyish colour. A well developed Ae is > 2 cm thick.
Soil light coloured	soils that have a low organic matter content; such soils may have various colours which due to low organic matter content make them appear light or bright.
Soil particle size coarse	sandy ¹ texture with > 35% coarse fragments or loamy ¹ texture with > 70% coarse fragments.
Soil base-low	soils formed from parent materials dominated by coarse fragments of low base status.
Mor	humus form comprised of predominantly F and H horizons; the F horizon being matted with common fungal mycelia.
Hydromor	poorly aerated Mor humus form under conditions of prolonged saturation by water.
Histomor	poorly aerated Mor humus form under conditions of more or less permanent saturation by water. They are comprised of poorly decomposed, fibrous peat material.
Hydromull	poorly aerated Mull humus form under conditions of prolonged saturation by water. They are dominated by Ah horizons; the F and H horizons being very thin.
Saprimull	poorly aerated Mull humus form under conditions of more or less permanent saturation by water. They are comprised of well decomposed, saturated organic materials.

¹ Sandy - LS, S; loamy - SL, L, SCL.

APPENDIX VI

Key to the identification of trophotope (part 2)



APPENDIX VII

Key to the identification of site sensitivity to fire (part 1)

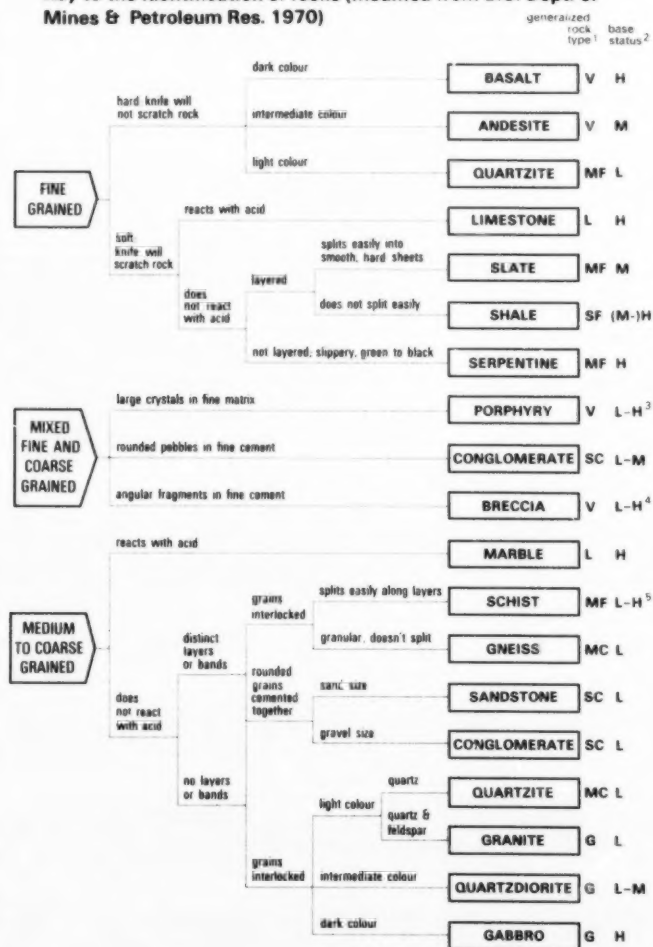
This key was developed to aid field staff in the Vancouver Forest Region in the identification of site sensitivity classes to fire. These classes indicate the potential impact of fire on the site and are used together with management factors in making slashburning decisions.

Category	Definition
Soil depth	depth from the mineral soil surface to a restricting layer such as bedrock, strongly compacted or strongly cemented material (e.g. hardpan).
Coarse fragments	unconsolidated materials > 2 mm diameter.
Humus form thickness	refers to thickness of organic horizons only (e.g. forest floor).
Ae horizon	a leached horizon in the upper soil profile characterized by a greyish colour. A well developed Ae is > 2 cm thick.
Ah horizon	an upper soil horizon enriched with organic matter (darker coloured than the underlying soil), > 2 cm thick.
Soil particle size	sandy ¹ with > 35% coarse fragments or loamy ¹ with > 70% coarse fragments.
Silty texture	SiL or Si texture.
Gleying	soils that have orange coloured mottles indicative of a fluctuating water table. Permanently gleyed soils are dull yellowish, blue, or olive in colour.
Mull	humus form comprised of very thin F and H horizons (< 2 cm); overlaying a well developed Ah horizon (> 2 cm).
Moder	humus form comprised of predominantly F and H horizons (> 2 cm); the F horizon is loose and friable with common in-sects.
VH	very high sensitivity class.
H	high sensitivity class.
M	medium sensitivity class.
L	low sensitivity class.
VL	very low sensitivity class.

¹ Sandy - LS, S; loamy - SL, L, SCL.

APPENDIX VIII

Key to the identification of rocks (modified from B.C. Dept. of Mines & Petroleum Res. 1970)



¹ V - volcanic; L - limestone; SC - sedimentary, coarse; SF - sedimentary, fine;

MF - metamorphic, fine - medium; MC - metamorphic, coarse; G - granitic;

² L - low; M - medium; H - high (from Hills 1955, Wilde 1956, Wainwright et al. 1980)

³ depends on composition of matrix

⁴ depends on component rock

⁵ depends on mineral composition

APPENDIX VII

Key to the identification of site sensitivity to fire (part 1)

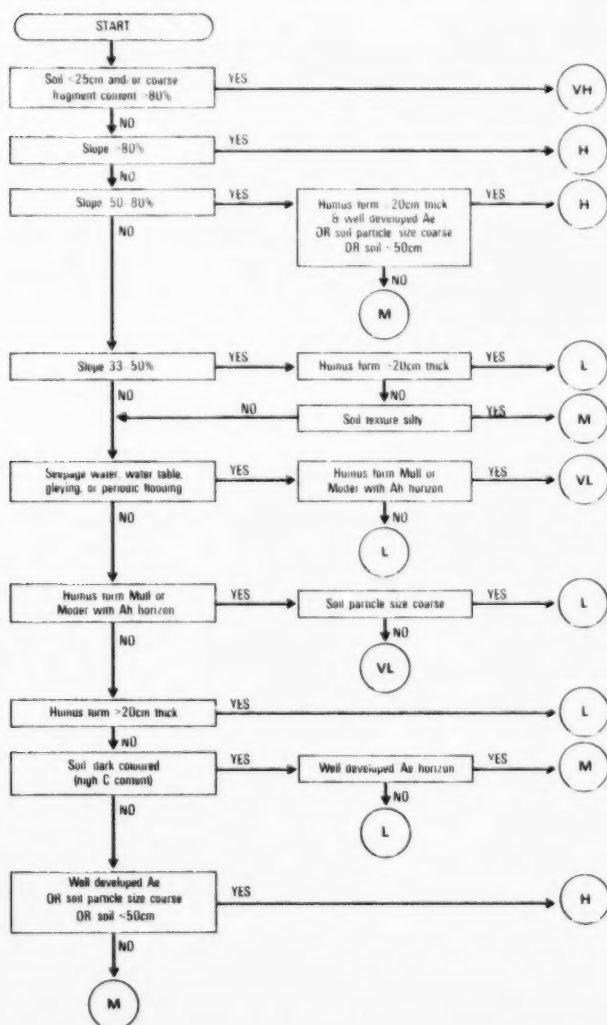
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Coarse fragments	unconsolidated materials > 2 mm diameter
Humus form thickness	refers to thickness of organic horizons only (e.g. forest floor).
Ae horizon	a leached horizon in the upper soil profile characterized by a greyish colour. A well developed Ae is > 2 cm thick.
Ah horizon	an upper soil horizon enriched with organic matter (darker coloured than the underlying soil), > 2 cm thick.
Soil particle size	sandy ¹ with > 35% coarse fragments or loamy ¹ with > 70% coarse fragments.
Silty texture	SiL or Si texture.
Gleying	soils that have orange coloured mottles indicative of a fluctuating water table. Permanently gleyed soils are dull yellowish, blue, or olive in colour.
Mull	humus form comprised of very thin F and H horizons (< 2 cm); overlaying a well-developed Ah horizon (> 2 cm).
Moder	humus form comprised of predominantly F and H horizons (> 2 cm); the F horizon is loose and friable with common in-sects.
VH	very high sensitivity class.
H	high sensitivity class.
M	medium sensitivity class.
L	low sensitivity class.
VL	very low sensitivity class.

¹ Sandy - LS, S; loamy - SL, L, SCL.

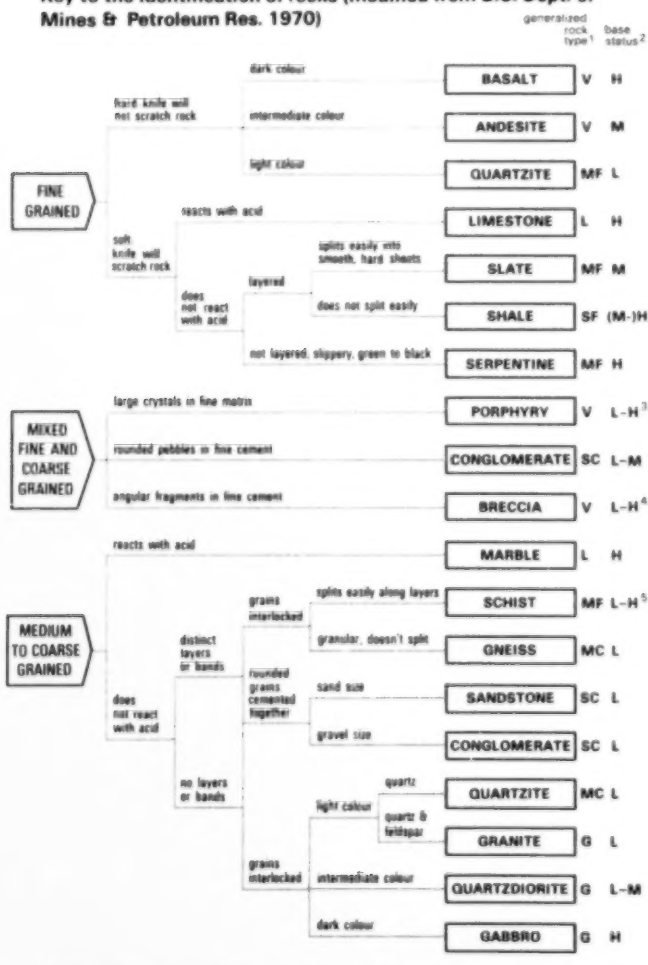
APPENDIX VII

Key to identification of site sensitivity to fire (part 2)



APPENDIX VIII

Key to the identification of rocks (modified from B.C. Dept. of Mines & Petroleum Res. 1970)



¹ V - volcanic; L - limestone; SC - sedimentary, coarse; SF - sedimentary, fine;

MF - metamorphic, fine - medium; MC - metamorphic, coarse; G - granitic;

² L - low; M - medium; H - high (from Halls 1955, Wilde 1958, Walmsley et al 1980)

³ depends on composition of matrix

⁴ depends on component rock

⁵ depends on mineral composition